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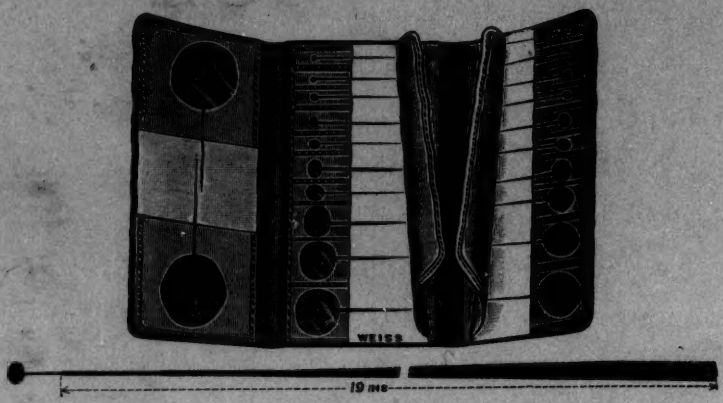

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THE BRITISH JOURNAL
OF
OPHTHALMOLOGY

OCTOBER, 1917

COMMUNICATIONS

THE EVOLUTION OF THE OPHTHALMOSCOPE*

BY

W. H. McMULLEN,
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LIKE many other important inventions and discoveries, that of the ophthalmoscope was the result of the completion and co-ordination, by an exceptionally gifted individual, of the work of many previous investigators.

From the very earliest times, the glowing appearance of the eyes of certain animals, when seen in a dim light, must have attracted notice. The phenomenon was referred to by many writers of antiquity, and formed the subject of much vague and fantastic speculation, devoid of any basis of scientific observation, until early in the 19th century.

Méry[1] in the year 1704, having held a cat under water, noticed that he was then able to see the blood-vessels and the colour of the retina. He was probably the first man to see the details of the fundus in the living eye. Five years later (1709), de la Hire[2] gave a correct explanation of Méry's observation, showing that immersion under water abolished refraction at the surface of the cornea, and thus enabled the fundus details to be seen. For more than a century after this the possibility of

*A communication to the 1917 meeting of the Ophthalmological Society of the United Kingdom. The full text will appear in the Society's *Transactions*.

examining the fundus details in the living eye appears to have been lost sight of, and the phenomenon of the glowing eye engrossed the attention of all students. The glow was supposed to be due to spontaneous development of light within the eye, under the influence of the nervous system, and was thought to become more vivid when the animal was excited. It was not until the year 1810 that it was proved by Prevost[3] to be due to reflection of light from the eye, as it was never visible in a room from which light was completely excluded. In the same year Gruithuisen[4] traced the effect to the operation of the tapetum, and Rudolfi[5] observed that in order to see the glow the observer must look into the eye in a certain direction. Further observations on this subject were published by several authors during the next forty years. Among these the work of Brücke is of most importance. In a paper[6] published in 1845 he clearly described the conditions under which the glowing reflex becomes visible, and correctly explained the varying colour of this reflex. He described his method of examination as follows: "I took in one hand a lighted candle from which proceeded the only light which illuminated the room, in the other I held an opaque screen of paper or wood, and shutting one eye, placed myself opposite the animal, lying in a corner of the room, so that its head lay in the visual axis of my open eye. The screen and candle were held close to the visual axis in such a way that the screen shielded my eye from the candle."

The blackness of the human pupil was a thing that had hitherto attracted little attention, being usually attributed to complete absorption of the light entering the eye by the pigmented coats. In fact, a full explanation of it does not appear to have been given until Helmholtz gave it in 1851 in his treatise on the ophthalmoscope.

A reflex from the pupil of the human eye had been observed in certain abnormal conditions, but the possibility of seeing such a reflex in the normal human eye was not recognized until the year 1846, when W. Cumming, at that time house surgeon to the London Hospital, published a very notable and suggestive paper[7] entitled "On a Luminous Appearance of the Human Eye." Cumming showed that it was possible to see light reflected from the fundus in the normal human eye by a method of examination similar to that employed by Brücke in the examination of animals' eyes. He stated the conditions necessary for seeing this luminosity as follows: "(*a*) That the eye must be at some distance from the source of light, the distance being greater in proportion to the intensity; (*b*) that the rays of light diffused around the patient (and sometimes around the eye itself) should be excluded; (*c*) that the observer should occupy a position as near as possible to the direct line between the source of light and the eye examined." He noted the variation in colour and intensity of the reflex with the

movements of the eye, and discussed the source of the reflection, coming to the conclusion that it occurred mainly at the surface of the choroid. It is particularly noteworthy that Cumming regarded the possibility of seeing the fundus reflex not merely as an interesting scientific discovery, but as affording a valuable means of clinical examination, as the following passage from his paper shows: "The establishment of the fact of a similar reflection from the human eye to that from the eyes of animals, appears to be chiefly important in its adoption as a mode of examining the posterior part of the eye. The retina and choroid, hitherto concealed in the living eye, and little opportunity being afforded of examining their condition after life, in consequence of their diseases not terminating fatally, considerable uncertainty has hitherto attended the diseases ascribed to these structures; but the existence of this luminosity, its non-existence, or abnormal appearance may enable us to detect changes in these structures hitherto unknown, or satisfactorily to see those which we only suspected."

In 1847, a year after Cumming, Brücke[8] described the appearance of luminosity in the normal human eye examined in this way. It appears certain that Brücke made this observation independently, for a few months after the publication of his paper on the subject, having then heard of Cumming's experiments, he published a short addendum[9] acknowledging the priority of Cumming's observations. Brücke, however, made an even nearer approach to the discovery of the ophthalmoscope, as is shown by the following extract from his paper: "When I had shown this experiment to a few of my friends, Dr. Carl von Erlach said to me that a long time ago he had seen through his spectacles the eyes of one of his friends glow. He had also questioned me about it once, a year before, but we were interrupted and the fact was not mentioned again. He had, however, often seen the appearance, and had noted that while he saw it his spectacles shone (*spiegelten*). He was able immediately to see my eye glow when I stood before him with my back turned towards the lamp, so that I saw the reflected image of the lamp in one of his spectacle lenses."

It was in the year 1847 that the first ophthalmoscope was invented by Charles Babbage, one of the most distinguished of British mathematicians. Unfortunately, no account of this instrument was published until the year 1854, when Wharton Jones[10] in a "Report on the Ophthalmoscope," published in the *Medico-Chirurgical Review*, wrote as follows: "It is but justice that I should here state, however, that seven years ago Mr. Babbage showed me the model of an instrument that he had contrived for the purpose of looking into the interior of the eye. It consisted of a bit of plane mirror, with the silvering scraped off at two or three small spots in the middle, fixed within a tube at such an angle that

the rays of light, falling on it through an opening in the side of the tube, were reflected to the eye to be observed, and to which one end of the tube was directed. The observer looked through the clear spot of the mirror from the other end."

Wharton Jones was a man of high character and great scientific ability, and there is no reason to doubt the accuracy of the above statement, more particularly as he was probably responsible for the failure of Babbage to pursue his investigations. As there is a reference to this subject in Mr. Brudenell Carter's "Text-book of Ophthalmic Surgery," I wrote to him to ask if he could tell me anything more about it. Mr. Brudenell Carter, now in his eighty-ninth year, very kindly replied to my letter, and wrote on April 25, 1917 : "I cannot now remember any further detail, except that Wharton Jones . . . committed the monumental folly of condemning the instrument, so that Babbage threw it aside as a toy of which he thought no more."

While to Babbage belongs the distinction of having first invented the ophthalmoscope, and while we may justifiably take pride in the fact that this achievement stands to the credit of one of our countrymen, that does not detract from the honour due to Helmholtz as the man who devised and made known to the world the instrument which revolutionized ophthalmology.

Helmholtz's monograph,[11] published in 1851, was a masterly work. He clearly expounded the optical problems to be solved, and showed the necessity of a method of looking into the eye exactly in the direction of the incident light. He explained how this could be achieved by the use of a transparent mirror, and described a really practical instrument for the examination of the fundus details. It consisted essentially of a transparent reflector, composed of three thin plane parallel plates of glass, set at an angle to reflect the greatest possible amount of light into the eye, while on the observer's side of the mirror was a holder for a concave lens to enable the fundus details of the patient's eye to be seen clearly. In addition, this treatise contained exhaustive studies of various points in relation to the instrument, e.g., the advantages of multiple reflecting plates over single, the most advantageous angle of reflection with different numbers of plates, the polarisation of light reflected by multiple plates and consequent diminution of the corneal reflex, the optical principles underlying the formation of the erect image, and the calculation of its magnification. He referred to the possibility of using two convex lenses, in place of a concave lens, for observation of the image, but did not describe the indirect method as we know it. He noted the insensibility of the optic disc. He indicated the possibility of determining the refraction of the eye with his instrument, and, as showing his appreciation of its clinical importance, I quote the following sentence : "In brief, I believe I may

hold the expectation, not to be exaggerated, that all the alterations of the vitreous body and of the retina, which until now have been found in cadavers, will also be recognizable in the living eye, a possibility which appears to give promise of the greatest advances in the hitherto undeveloped pathology of these structures."

There is reason to believe, however, that Helmholtz did not at first fully realize the epoch-making character of his invention. It was von Graefe who first grasped this. Donders[12] in 1886, in the course of an address on the occasion of the presentation to Helmholtz of the Graefe medal of the Heidelberg Ophthalmological Society, referred to this matter as follows: "He (i.e., Helmholtz) never thought, or at least he never said, that the new instrument implied the dawning of a new era for ophthalmology. von Graefe felt it immediately. When he for the first time saw the background of the eye, with its nerve entrance and its blood-vessels, his cheeks reddened, and he called out excitedly, 'Helmholtz has unfolded to us a new world!'"

Helmholtz [13] in his speech on this occasion, gave the following interesting account of its discovery. "The ophthalmoscope has unfolded itself to me simply out of the necessity of discussing, in my lectures on physiology, the theory of emission of light from the eye. Why does the human eye not glisten under ordinary circumstances, since in its background there is situated a spot—small, indeed, but clear white, that is to say, the end of the optic nerve, which must reflect light in the same way as the most sparkling tapetum of animals' eyes? Why do animals' eyes shine with such remarkable lustre, though they may be only illuminated by a small distant flame? These questions, when once proposed, were not difficult to answer, and now the answer is known to everybody. Once answered they furnished the means of lighting up the eye of another human being and of seeing it plainly." It appears therefore that the discovery of the ophthalmoscope is another example of a result of enormous practical importance following research in pure science, in some degrees comparable to the revolution in medicine and surgery, which began with the study by Pasteur of the crystals of tartaric acid.

Among the chief defects of Helmholtz's ophthalmoscope were inadequacy of illumination, an inconvenient and time-consuming arrangement for changing the lenses, and the fact that owing to the distance between the eyes of patient and observer the field of view of the fundus was small. Nearly all the extremely numerous modifications of the instrument since introduced were designed to overcome to a greater or less degree these various defects.

Improvement in the illumination was secured by the use of a mirror, either with a portion of the coating removed from a small area, or with a perforation in the centre. In 1851, only a few

months after the publication of Helmholtz's treatise, Epkens[14], a Dutch mechanic, constructed an ophthalmoscope with a plane mirror, with the coating removed from an oval area in the centre. Ruete,[15] in 1852, used a perforated concave mirror, and described the indirect method of examination.

An improvement in the method of changing the lenses was very soon devised by Rekoss, an instrument maker of Königsberg, who modified the original Helmholtz instrument by the addition of two superposed rotating metal discs, each containing four concave lenses of different strengths and a clear aperture.

Innumerable patterns of ophthalmoscope have since been designed. Every conceivable form of reflector has been employed—plane, convex and concave mirrors, with the most various curvatures and diameters, combinations of plane and convex mirrors with convex lenses, silvered lenses, totally reflecting prisms, and the cemented surface of a Nicol's prism.

As regards the arrangements for changing the lenses behind the sight hole, we may group the various devices into four classes: (1) holders or clips into which lenses were inserted singly as in Liebreich's small ophthalmoscope, which is the most familiar example of this class; (2) modification of the Rekoss disc—single, double, or triple discs, or one or two discs with a segment of another; (3) one or more narrow plates with rows of lenses arranged to slide up and down behind the sight-hole; (4) the magazine arrangement devised by Couper, which is also employed, in combination with a disc, in the familiar Morton's ophthalmoscope.

The advantage of being able to approach very close to the patient's eye for direct examination, and at the same time looking perpendicularly through the correcting lens, led to the introduction of various forms of tilting or obliquely set mirrors.

For a time binocular ophthalmoscopes enjoyed considerable popularity. The first of these was designed by Giraud-Teulon (1861). It was found in practice that there was little advantage in getting a binocular view of the fundus, and no binocular instrument could be made as simple and convenient to use as a monocular one. Instruments have also been designed to enable two or three observers to examine the fundus simultaneously.

The first electric ophthalmoscope was invented by Dennett, of New York, in 1884. In 1886 Dr. Thomas Reid, of Glasgow, designed an interesting electric ophthalmoscope with a prismatic reflector and a micrometer scale, an image of which was projected on the fundus. This instrument was shown at a meeting of this Society, but never placed on the market. We have the original model on exhibition here to-day. Another early type of British design is Juler's (1886) which we are also able to show. Most of

the recent developments of this type are, of course, familar to all ophthalmologists.

This brief review of the evolution of the ophthalmoscope is necessarily incomplete. Time will not permit of any description of many interesting types, such as various forms of autophthalmoscope, nor of the recent developments in reflexless ophthalmoscopy, in which Gullstrand's work is pre-eminent.

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A CASE SHOWING THE EVIDENCES OF RAISED INTRACRANIAL PRESSURE IN SUCCESSIVE PREGNANCIES, AND ATTRIBUTED TO EXAGGERATION OF THE ENLARGEMENT OF THE PITUITARY BODY, NORMAL TO PREGNANCY.

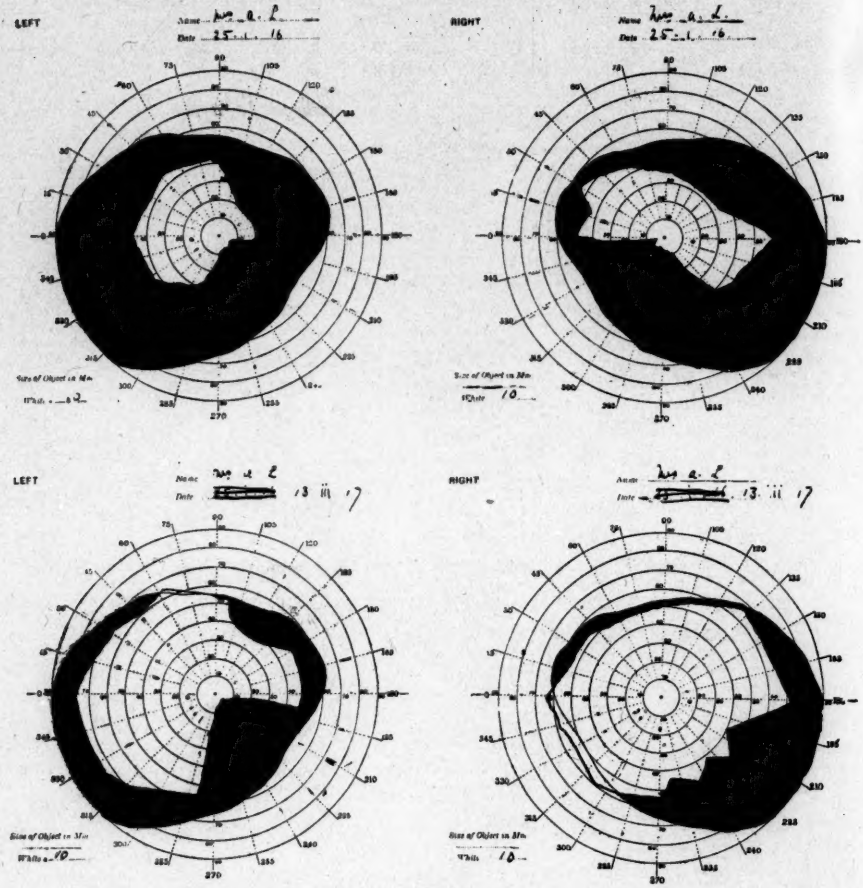
BY

J. HERBERT FISHER,

LONDON.

MRS. ANNIE L———, 30 years of age, saw me at the Royal London Ophthalmic Hospital on January 25, 1916, complaining of misty vision, variable, but the left eye was considered to be the worst. For about four months she had experienced double vision and had been having very severe headache for three months. At this date she was five months advanced in pregnancy, and had up to that time suffered from much vomiting, but it was not so bad as it had been. She had suffered from vomiting in two previous pregnancies, but the symptom did not persist so long as it had done on the present occasion. It was found that she had paralysis of the left external rectus, and that the sight of this eye was 6/18, three letters. With the right eye the vision was 6/6: pupils were normal. There was

slight nystagmic jerking recognisable when the eyes were examined with the ophthalmoscope. Knee-jerks not exaggerated. It was found that each optic disc had an atrophic appearance, and that the atrophy in each had undoubtedly followed a papillitis. The right disc was paler than the left, but the left was the more blurred



and indistinct in surface and in outline. There were white lines traceable along the vessels, particularly in the left eye. At the outer and upper quadrant of the left disc one or two spots of ? faint hæmorrhage, and a small group of gleaming dots adjoining the outer edge, of hæmorrhagic origin, were noticed. The urine was normal. Fields

of vision were charted, but I would not be too confident that the patient very accurately comprehended what was required of her, and too much stress should not be laid upon them, although they are probably approximately correct. She was seen by Dr. James Taylor, who was unable to offer any explanation, except the suggestion that she had suffered from intra-cranial tumour, which had become quiescent. She attended only on one or two occasions at this date, but returned on June 27, 1916, when she reported that confinement occurred on May 26, 1916, and that she felt quite well. The child born was well and healthy.

Paralysis of the left external rectus muscle was still present. The right eye read four letters of 6/6, and the left eye read three letters of 6/12. The optic discs presented the same appearance as before, but there was no evidence of any active mischief in progress.

I did not see the patient again until March 13, 1917, when her doctor wrote me a letter which she brought to the hospital. He reported that when the child was born, but not before, she completely lost all pain in the head, and since then was quite free from it until she became pregnant again some four months ago, when all the head pains returned within a month of the onset of pregnancy. This pregnancy terminated spontaneously at three months, and since then she has been quite relieved of her headaches. I found on March 13, 1917, that the right eye read 6/6, the left eye 6/9 pretty fully, and some letters of 6/6. The left sixth nerve paralysis was still as before, but she was not very much bothered by her diplopia.

The appearances of the discs were as on the previous occasion, with the exception of the fact that there was nothing in the way of hæmorrhage or exudative spots : they were pale and atrophic, the left showing more change than the right, and while the right, as before, showed evidence of antecedent papillitis, these evidences were more decided in the left eye. Perimeter charts at this date revealed a partial right hemianopia, the lower right quadrant being lost in each field with a slight peripheral loss in the upper right quadrant. The blind sector in the lower quadrant approached much nearer to the fixation point in the left than in the right eye.

Summarising the case, we have an example of a woman who had suffered from double papillitis and symptoms of vomiting, which may probably have been of cerebral origin, associated with pregnancy, severe headache coming on a few weeks after the onset of pregnancy and accompanied by a paralysis of the left external rectus muscle, complete recovery as regards pain after confinement. A few weeks after again becoming pregnant, the headache returned as before; this pregnancy terminated at three months spontaneously. The sixth nerve parálysis persisted on the left side and she developed a partial but quite definite hemianopia, indicative of pressure on the left optic tract.

In a former paper dealing with the cause of Leber's disease, I pointed out that the pituitary body is known to enlarge to two or three times its normal dimensions in association with pregnancy, and that it fills with a milky juice which can be pressed from it.

The hypophysis is known to be larger in a woman who has borne children than in a nullipara. The explanation in this case seems to me to be that the enlargement of the pituitary body associated with pregnancy exceeded the limits of the normal, and sufficiently so to cause pathological increase of intra-cranial pressure in two successive pregnancies ; the enlargement extended particularly to the left side of the sella Turcica, and thus involved the left sixth nerve in the floor of the cavernous sinus groove, and to some extent the left optic tract.

The X-ray picture reveals a sella Turcica of rather unusual depth and with the anterior and posterior clinoid processes closer together than usual. In such a fossa any unusual and rapid swelling of the pituitary body would probably find its path of least resistance to be in the lateral directions, and in this case the swelling gland expanded particularly towards the left side.

A CASE OF DETACHMENT OF THE RETINA AT THE ORA SERRATA*

BY

ARNOLD LAWSON.

LONDON.

CLINICAL reports of detachment at the ora serrata must be very rare. In my somewhat hasty search through ophthalmic records I have not managed to find a single case and certainly I have never seen one similar to this. As a pathological specimen the condition, though rare, may occur if there is a great shrinkage of inflammatory vitreous exudates, but in such cases the eye must generally be blind before the occurrence, or at any rate so nearly so that a detachment at the ora serrata could not be seen. In the case I am about to relate, the diagnosis was made clinically by ophthalmoscopic examination and subsequently confirmed by pathological investigation.

The patient was a lieutenant of 23 years, who came to see me first at the latter end of October, 1915. He had been wounded at the Dardanelles in the previous May. A bomb burst near him wounding him in the right groin, and almost simultaneously he was struck on the left leg by two bullets, one of which killed his

* A communication to the 1917 meeting of the Ophthalmological Society of the United Kingdom. The full text will appear in the Society's *Transactions*.

neighbour on his left. Please observe that he was not to his knowledge wounded in either eye, but he said that his neighbour on the left was shot in the head, and that the head was greatly shattered, and that he was struck and spattered on the left side of his face by fragments of the skull and soft parts, blood, etc.

When he came to me the condition was as follows :—

Right eye. V. = 6/5 easily. Eye normal in every respect.

Left eye, V. = 6/24 not improved. The pupil was dilated to its widest limits and immobile. There was a slight general vitreous haze with one rather large grey opacity which moved freely. The condition of the retina and choroid was perfectly normal. The movements of the eye were free and painless; the sclera was quite white; there was no sign of corneal precipitates and the pupil was evenly dilated without notching or any sign of inflammatory adhesions. In fact, the eye was perfectly quiet. Examination of the field showed a slight general and fairly even contraction. Centrally there was a small relative colour scotoma.

I concluded that he was suffering from the effects of a severe concussion. This view was favoured by the history and by the fact that the face on the left side was a good deal bruised at the time he was wounded.

I told him that the length of time that had elapsed since the accident made the prognosis as to recovery of sight rather doubtful, but I thought there was a great probability that he would not get any worse.

He was not much inconvenienced except that he was happier with the left eye covered. This I put down as being in part at any rate due to the mydriasis, and I ordered weak eserin drops (gr. 1 ad 1 oz.) to use occasionally.

I saw him two days later and the eserin had answered perfectly, contracting the pupil to its fullest extent, and his vision was improved thereby to 6/12 and letters of 6/9. I might say that I could not get this improvement with a stenopæic disc on the previous visit. He was told to go on using the eserin, the strength of which was reduced to gr. ½ ad 1 oz.

I saw him again about six weeks later. The eserin had been only successful in that it contracted the pupil for a few hours. If not used, the mydriasis became as extreme as it ever had been. The attempt to improve the action of the sphincter by stimulating it had therefore failed entirely. Further, the eserin caused a good deal of temporary aching and confusion of sight after its use. On this account I advised the patient to give it up.

The vision at this date was precisely as before, and the field and ophthalmoscope picture were unchanged.

I next heard of him by a telegram on February 1 saying that he had suddenly lost a great deal of his sight. When I saw him he

told me that when out walking with a friend he felt the sight of his left eye become suddenly worse, so that about three-quarters of the whole field disappeared and he could only distinguish objects placed high above the horizontal level. When he got home he noticed that the pupil, which was widely dilated as usual on starting out, had become much smaller.

On examination I found the pupil equal in size to the other and reacting both directly and consensually, though not normally so. The eye was rather photophobic and flushed, and the vision reduced to hand movements. I dilated the pupil, and an extraordinary picture was revealed. A fine lace-like veiling, which focussing showed to be the retina, was hanging detached over the lower two-thirds of the picture, leaving a gap above it through which the choroid and its vessels were easily and plainly seen. The upper margin of the detachment went straight across the field and was quite close to the lens and uniform in outline and sharply marked without apparent rent or fold. I concluded that it must be a detachment very close to the ora serrata, and ordered him to bed in a nursing home. At the same time, seeing that the picture was so strange and unusual, I asked Mr. E. Treacher Collins to see the case with me. The occurrence of this detachment and the consecutive change in the pupil made me suspect that there was, after all, a foreign body in the globe somewhere about the ciliary region, the irritation of which had induced the pupil changes and which, in some way difficult to explain, had brought about the detachment. Consequently, after a few days' rest in bed, during which time all the photophobic and inflammatory symptoms disappeared, I asked Sir J. Mackenzie Davidson to skiagraph the eye. This he did and found a minute foreign body localized in the neighbourhood of the ciliary body on the outer side. I decided that, considering all the circumstances, there was nothing to be gained by attempting to remove it.

After a short stay in the nursing home, during which time the upper field became defective also, I sent him home to rest quietly for a time. When at home the lower visual field became much better, so that he could once more distinguish large objects below the horizontal line, but the upper field remained very bad.

When seen again about four weeks after leaving the nursing home I found that the retina to a large extent had apparently re-attached itself above, and I could for the first time make out a small shining foreign body high up on the outer side and just within range of ophthalmoscopic examination.

The eye soon afterwards began to show signs of disorganization and became very irritable, the tension became markedly raised and the iris became more and more discoloured, which I thought was probably due to siderosis. The eye was also painful at times,

and, all things considered, I strongly advised him to submit to enucleation, which was performed about three months after the first appearance of the detachment. I may add that the foreign body disappeared from view shortly before I removed the eye. It apparently shifted up with the retina in which it was entangled.

Pathological Report by Mr. E. Treacher Collins

Eyeball received from Mr. Arnold Lawson. It had evidently been in spirit, as the cornea was opaque. It was transferred to a 4 per cent. formalin solution and afterwards frozen and divided by an antero-posterior vertical section. The cornea, besides being opaque, was somewhat wrinkled, due to hardening reagents. The lens was opaque, due to the same cause. The anterior chamber was filled with a gelatinous coagulum. The lens was rounder in shape than normal and displaced slightly upwards. The retina was detached and formed a much puckered membrane lying in the centre of the eyeball. There was hardly any vitreous chamber left, only a small area posteriorly. The space between the retina and choroid was completely filled with a grey coagulum of gelatinous consistency. After this had been removed from the outer half of the globe, the retina at the ora serrata, together with a portion of the pars ciliaris retinæ, was found to be torn away from the ciliary body, both above and below. The only portion of the retina in the region of the ora serrata which retained its attachment was on the outer side of the globe. The whole circle of the pars ciliaris retinæ, together with the suspensory ligament of the lens, had become drawn towards the centre of the globe and to its outer side. At the outer and upper part of the globe a conical projection was seen to pass from the outer surface of the detached and puckered retina, and pass backwards to become adherent to the choroid a little in front of the equator. At the spot where the retina was adherent to the choroid there was a circular area of choroidal atrophy. Behind the lens, at its lower margin, between it and the detached pars ciliaris retinæ, a small foreign body was found, which on being touched crumbled into two. It was attracted by a magnet.

The spot of choroidal atrophy in the upper and outer part of the globe, to which the retina was adherent, was evidently the point of entrance of the foreign body. It must have passed through the vitreous behind the lens to the ciliary region on the opposite side of the globe. The contraction caused in the anterior part of the vitreous, in the track of the wound, was the probable cause of the dragging inwards towards the centre of the globe of the hinder portion of the pars ciliaris retinæ and the retina in the region of the ora serrata.

FUNCTIONAL SPASM OF ACCOMMODATION*

BY

LESLIE PATON,

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TRUE spasm of accommodation is one of the rare conditions met with in ophthalmology. Hirschberg writing in 1884 says: "I scarcely believe in the existence of acute and not at all in the existence of a chronic form of accommodative spasm. I have never seen one case out of many thousands tested by the ophthalmoscope and by glasses." Hess, in the second edition of Graefe-Saemisch's *Handbuch*, also expresses a similar belief as to the rarity of the condition. In the *Transactions* of the Ophthalmological Society there are only two papers dealing with the subject, one by Adams in Vol. II (page 180) in which he gives an account of two cases, and another by Fitzgerald in Vol. IV (page 311), also giving two cases.

As the term "spasm of accommodation" is frequently used by oculists, it is necessary for me to define what I mean when I use it in this paper, and to exclude certain types of cases to which the term is sometimes applied. In some young hypermetropes the ciliary muscle is maintained in a condition of partial contraction which may compensate partly or fully the amount of hypermetropia. This is not accommodative spasm and should not be called by that name. It is a physiological adaptation in the interests of clear vision, and in all probability is attained by the action of the circular ciliary muscle alone, which, like other sphincter muscles in the body, easily lends itself to the maintenance of a state of tonic contraction.

Again, a small degree of spasm of the ciliary muscle undoubtedly exists in a definite proportion of myopes, especially among uncorrected myopic school children. This seldom amounts to more than 1 D. or 2 D. and is not spasm of the accommodation in the sense in which I use the term here. It may only be a phenomenon associated with the increased convergence that uncorrected myopes and astigmatics adopt to get clearer vision. If so, it belongs to a category analogous to the class of hypermetropes spoken of above.

True spasm of accommodation may be defined as the sudden development in one or both eyes of a high degree of apparent myopia which disappears under the influence of atropine. The spasm may be either continuous or clonic, or may pass from a clonic to a continuous condition, and may be associated with spasm of other ocular muscles.

My first case occurred in a young lady, now aged 21, of good stock and excellent general health. At the age of five she was noticed to have a slight convergence of the left eye, and at that

* An abstract of a paper read before the Ophthalmological Society, 1917. The full paper will appear in Vol. XXXVII of the *Transactions*.

time (1903) she had + 1·5 D. of hypermetropia in each eye. In 1907 there was still occasional convergent strabismus, In 1909 a tendency to occasional divergence had appeared, although she had good stereoscopic vision and excellent acuity. (Atropin correction, R.E. + 0·75 D. sph., L.E. − 0·25 D. sph.) No change of any importance occurred till 1912 when she complained of double vision when she took her glasses off. With glasses she had visual acuity $= \frac{6}{5}$ in each eye and good stereoscopic vision. The complaints of diplopia, especially on reading, increased, and by April, 1913, a definite divergent strabismus of the left eye, amounting to 14°, had become established. As this remained steady for some months I tenotomised the left external rectus in May, 1913. The primary result of the operation was that her eyes were straight, and she could maintain single vision for long periods, although when tired, she got diplopia, which, however, was now ***homonymous*** and ***not crossed***. At the end of June her refraction, tested without a mydriatic, was R.E. — 0·75 D. sph. ⌒ — 0·25 D. cyl. ax. hor. V.$= \frac{6}{6}$. L.E. — 2 D. sph. ⌒ —0·5 D. cyl. 10° V.$= \frac{6}{6}$. During the autumn of 1913 a variable amount of convergence developed and the homonymous diplopia became so troublesome that the left eye had to be screened. At the end of October she suddenly began to complain of very bad vision. There was now a manifest convergence of 10° to 14°, but the most remarkable feature was an apparent myopia in the R.E. of — 7 D. and in the L.E. of — 9 D. This, however, was variable, and seemed to be in definite relationship to the variations in the amount of convergence. When fully atropised her refraction proved to be in the R.E. — 0·5 D. sph. $= \frac{6}{6}$, L.E. — 1 D. sph. ⌒ — 0·75 D. cyl. ax. hor. V.$= \frac{6}{6}$. The spasm of accommodation reappeared as soon as the atropin was given up.

She has been seen by Lawford, Spicer, the late C. E. Fitzgerald, of Dublin, and Landolt, and as the full descriptions of all these observers agree fairly closely, I may briefly summarize the case as it appeared at this time. The angle of convergence varied from 18° to 32°, occasionally reaching 30° when fixing with the right eye. On the whole the movements were very similar whichever eye she used. The eyes were seldom still, but the non-fixing eye moved out and in constantly, although the movements were much slower and more deliberate than in any form of nystagmus. There was a similar, although slight, variability in the size of the palpebral apertures. The spasm of accommodation reached a height equal to 7 D. of difference in each eye, but by gradually reducing the strength of the lenses, could be almost completely abolished.

Landolt's opinion was that as the spasm followed the tenotomy of the left external rectus it must be in some way due to the interference with muscle balance produced by this tenotomy, and his suggestion was to advance the tenotomised muscle to its original

position. Both Lawford and I had grave doubts as to the expediency of this, and Holmes Spicer had also pronounced in favour of no interference. However, the father, who is a medical man, wished Landolt's suggestion to be tried, and asked me to do the operation. Under the anæsthetic, I found, as I had expected, that the visual axes were parallel, if not slightly divergent, and of course I had to aim at producing by advancement a divergence of approximately 15°, in which I was fairly successful.

In brief, her subsequent history is that her eyes vary from a condition of divergence, with very little spasm, to wild convergence with spasm of 9 D. or 10 D. She will go on comfortably using the right eye for some weeks without getting any spasm, but getting it at once on attempting to use the left eye, and then suddenly will find that the position is reversed, and that now she can only use the left eye. Despite this remarkable ocular history, she has been able to work for the last two years fairly steadily at the Ministry of Munitions, where she is still working.

Since the war began I have seen somewhat similar cases, to one of which I may refer briefly. Private C. J. had a slight concussion of the brain in February, 1915. I saw him in July, 1915, with marked spasm of convergence, blepharospasm and great limitation of visual fields. His refraction without atropin was — 6 D. Sph. in each eye. Under full atropin he proved to be hypermetropic + 1 D. Sph. in each eye. The blepharospasm and convergence spasm gradually diminished without the accommodative spasm being much affected, but by February, 1916, all trace of spasm had gone, his visual fields were full, and his visual acuity was 6/6 in each eye without any glasses.

I have put these two cases on record as examples of true spasm of accommodation, and I think that in each one is justified in adding the term "functional." Certainly the second case was typically a functional disturbance, and though the first case presents many complexities, I have little doubt that it, too, is best grouped under the same heading.

DISEASES OF THE EYE OF OBSCURE ORIGIN*

BY

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THERE must be few ophthalmic surgeons to-day who are satisfied with having labelled a case as "rheumatic iritis." It is a comforting diagnosis from the patient's point of view, because the lay public

*A paper read before the Ophthalmological Society, May, 1917. The full communication will be published in the Society's *Transactions*.

think they know all about "rheumatism," and the patient will therefore go away quite satisfied that the cause of the trouble has been probed. But although the term "rheumatic iritis" is a useful one, it should not blind us to the fact that we have not arrived at the ultimate cause of the condition when we use this term. Again, the term "gouty iritis" is a very loose one and conjures up but a vague mental picture of the pathogenesis of the process. Probably true gouty iritis may have existed at a time when acute gout was a prevalent disease amongst the middle-aged and elderly, but acute gout is, I believe, very uncommon nowadays, so uncommon indeed, as to be almost a rarity.

Acute inflammatory diseases of the uveal tract are, apart from injuries, probably almost invariably of infective origin, but it is not always so easy to prove this statement as to make it. The infection may be part of some other general infective disease, i.e., syphilis, tuberculosis, typhoid fever, and so on; or it may be the result of an auto-intoxication arising from various regions of the body. These may be:—

(1). *The alimentary system.*—Pyorrhœa alveolaris is recognized as a fertile source of infective process. The tonsils, again, when the seat of chronic infection, may be the cause of an iritis (as has, I believe, been shown). Lower down the tract intestinal fermentation has been shown to be a cause of irido-cyclitis. This was ably demonstrated by J. B. Lawford and others in the debate on alimentary toxæmia at the Royal Society of Medicine in 1913.

(2). *The respiratory passages.*—(*a*) The accessory nasal sinuses. I have seen a case where a constantly relapsing iritis was cured by operative treatment for pansinusitis which had its origin in a frontal sinus suppuration. The patient had refused to undergo the radical cure of her nasal suppuration for many years, during which time she had frequently recurring attacks of irido-cyclitis which brought her sight down to 6/60 in each eye. Since operation, now two years ago, she has had no relapses, though, owing to vitreous opacities and old deposits on the lens capsule, vision does not improve.*

(*b*) A chronic empyema or bronchiectasis may equally well produce the condition, though I have not come across such a case.

(3). *The genito-urinary tract.*—Under this head gonorrhœa may be accounted the most important factor. In the male a long forgotten attack of gonorrhœa may be the cause of an obstinately recurring iritis. I have notes of a man who has had slight attacks of iritis (about twice a year) for many years. He owned to a mild attack of gonorrhœa twenty years previously; after massage of the prostate, prostatic plugs and gonococci were found in the urine.

* Since writing this paper this patient has reported herself. She has been acting as an orderly in a military camp in North Wales, and has been "roughing" it during the whole of the severe weather of this last winter, without any relapse. Surely a proof that "cold" and "rheumatism" have nothing to do with her irido-cyclitis.

Vaccine treatment decreased the frequency of the attacks, but did not cure him. Probably re-infection takes place from the prostatic crypts from whence it is almost impossible to expel the gonococci. In women, proof is not so easily obtained, but undoubtedly this is a factor that must ever be borne in mind. These cases are not at all easy to treat. Some seem to respond very well to vaccines; others do not respond at all.

My object is, however, to draw attention to the bladder as a possible cause of an attack of iritis, when no obvious cause of infection is to be found. Let me quote very briefly the notes of three cases:

(i) C. A. L., spinster, *æt.* 45, consulted me in September, 1914. She gave a history that a fortnight previously one day she found she could only see one half of things at times. Just at first this phenomenon lasted a few minutes at a time, but later on in the day persisted almost without intermission. The following day the left eye was misty, and two days later it became bloodshot and painful. She had had a transient attack of "one-sided blindness" (hemianopia) followed by severe headaches when 15 years old, and had had two other attacks of inflammation in the right eye previous to the present attack. There was a history of slight constipation. When seen she had vision R.E. without glasses 6/12, with—0·25. D. sph., 0·75 D. cyl. axis 120°=6/6. L.E. 6/24 and J 2 in each eye.

Examination.—In the L.E. there was no injection, but numerous fine spots on the lens capsule in the area of the pupil, and some vitreous opacities. The iris appeared normal.

She was wearing an artificial denture underneath which were several stumps. She had also a naso-pharyngeal discharge and much leucorrhœa: urine normal. She looked ill and had been losing weight for some time, and had suffered from stiff neck and pains in the shoulder, etc. All the stumps were removed from the mouth as soon as possible. The nasal sinuses were found to be clear and the naso-pharyngeal discharge soon improved under simple nasal douching. She was ordered to take small doses of Epsom salts daily, and the usual local treatment to the eye. In spite of this the left eye got worse, and at the end of a month the right eye showed marked signs of irido-cyclitis, and there were numerous "mutton-fat" deposits of keratitis punctata in each eye. In March, 1915, she was still doing badly and losing weight. Some crepitations were found in the right lung about that time, but no tubercle bacilli were found in the sputum. Injections of tuberculin were tried in small doses, gradually increasing in strength for some time, but with no effect upon her weight or the course of the iritis. In May, 1915, she was still losing weight rapidly (2½ lbs. in 14 days) and R.V. 6/60, L.V. 6/18. No details of the fundi could be obtained,

in either eye on account of the vitreous haze. Further examination at the end of June resulted in the isolation of bacillus coli from the urine and she was advised to have vaccines. This was started in July, 1915. After the sixth injection her sight was improved. In September, 1915, it was R.V. 6/12, L.V. 6/18. There was keratitis punctata and vitreous opacities in both eyes still, but the fundus could be seen in the right eye and appeared normal. By October, 1915, her vision was R. 6/12 and L. 6/12 (some). The last injection was given at the end of October. Thereafter her general health improved, and she began to put on weight, but she continued to have transient attacks of pain and mistiness in one or the other eye, kept under control, however, by atropine. On the other hand, sight continued to improve steadily up to July, 1916, when she had vision R. 6/9 (ii), L. 6/6 (ii). There was no keratitis punctata to be seen in either eye, and just a few very fine opacities in the vitreous; fundi both normal.

(ii) The second case was that of E. E., spinster, *æt.* 35, working as a tailoress, who was seen in August, 1915. She complained of mistiness of sight which had lasted six months, and had suffered from epilepsy for nine years. Her vision R. 6/12, J. 2, L. 6/18 (1) J. 2. She had a slight amount of mixed astigmatism, correction of which improved the sight of the left eye to 6/12. On examination under a mydriatic the pupils dilated well, but there was a large adhesion of left iris to lens capsule and in both eyes deposits on lens capsule and some fine keratitic deposits. Vitreous clear. Fundi normal. Her vision gradually got worse, but no cause for the irido-cyclitis could be found until November, when the urine was examined and found to yield pure cultures of bacillus coli. At that time her vision was R. 6/36, L. 6/60; this was due to marked keratitis punctata in each eye and vitreous opacities. Autogenous vaccines were started, but she never responded to them, though her general condition was much improved. I lost sight of her for some months, but saw her again last March. Her condition was much the same, but her vision was R. 6/60 and L. 4/60. At no time has there been any redness of the eye.

(iii) J. G. J., spinster, *æt.* 18, seen September, 1915. She gave a history of constantly recurring frontal headaches for 12 months. Ten days before consulting me her eyes became inflamed; the left first and then the right. Her vision also began to get blurred. Her general health had been good. Vision: R. 6/12 and J. 2, L. 6/12 (1) and J. 2. No refractive error. Examination of R.E. showed marked keratitis punctata with normal pupil. Left eye showed slight ciliary haze, a large amount of keratitis punctata, and at one spot so thick was the lymph that it was hanging down in the anterior chamber from the back of the cornea, and there was a little hypopion. The pupil was sluggish, and new-formed blood-

vessels were present on the surface of the iris. In both eyes some vitreous opacities were present. No obvious cause of sepsis was found until the bacillus coli was isolated in pure culture from the urine. She was at once given autogenous vaccines. In three weeks time there was no injection of the eyes; the keratitis punctata had practically disappeared and the vitreous seemed clear. I last saw her in November, 1915, i.e., two months after her first visit, and at that time her vision was R. 6/12, L. 6/9 (1). I understand she has remained well since.

I have had three or four other cases in which the bacillus coli has been found in pure culture from the urine, two of these were, I believe, in males, but I have not included those cases, as the investigation was not completed nor had special treatment been carried out.

There are just a few points with regard to the cases I have seen which I should like to dwell on.

Most of these cases have occurred in women and they have not uncommonly been associated with some constipation, though in the second and third cases this was not a prominent feature. But in view of the presence of constipation there is of course a flaw in the proof, for the infection may come from the alimentary tract primarily and not through the bladder, because of course the intestinal mucous membrane is more likely to be a good absorption area than that of the bladder. In view of that fact, I always prescribed daily doses of Epsom salts, but without influencing the disease until vaccines were given. The last case I quoted, however, is somewhat striking in the rapidity of the cure.

I have brought these cases forward, not because I think I have proved anything, but because it may possibly lead to other observations on the influence of unrecognized bladder infections as a cause of chronic inflammatory affections of the uveal tract. The colleague with whom I was working and who was doing the bacteriological work is at present in France, so that the work is now suspended, but I hope in happier days to come to resume this line of investigation.

A CASE OF "UVEO-PAROTITIS WITH IRIDO-CYCLOPLEGIA."*

BY

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ON March 10, 1916, Maggie R. (30), a tablemaid, was brought to me by her mistress. She looked well nourished, and there was

* A communication to the 1917 meeting of the Ophthalmological Society of the United Kingdom. The full text will appear in the Society's *Transactions*.

nothing exceptional to note in her general appearance, except that she was slightly anæmic and depressed and anxious about the condition of her eyesight. She had been in the same situation for eight or nine years and was a well conducted and highly-valued servant.

History.—At the age of seven or eight she had measles and since then had been liable to slight blepharitis marginalis, and on that account had sometimes to be kept from school in winter if the weather was cold. At the age of eleven, being a native of Montrose, she went into a factory for the making of yarn from flax, and worked there for ten years. Thinking that this rather dusty occupation was keeping up the lid weakness, she decided to leave the factory and engage in domestic service. She was in the habit of using boric lotion for her eyes and occasionally Singleton's ointment. In other respects she had no complaint about her eyes or eyesight until the onset of her present illness. She had never had mumps and, so far as she knew, prior to her present illness, had not been in contact with any persons suffering from mumps. At the age of 20 she had all her teeth removed. She had enjoyed good health until a fortnight before coming to me, when she had what she described as a "cold," with cough. There had been no sore throat nor any known contact with diphtheria. On further enquiry, it was admitted that there was not much catarrh in the head, but rather a feeling of malaise and pains about the stomach, with a certain degree of nausea, so that she feared to eat lest she should be sick. A day or two afterwards there was some swelling of her eyelids and soon thereafter a difficulty in reading small type in the newspaper. This became aggravated, so that a few days later she could not see even the larger headings of the paragraphs. There was an inclination to close the eyes, apparently due to photophobia.

Present State.—When I first saw her on March 10, 1916, there was a slight, diffuse, deep conjunctival and very moderate ciliary injection. The pupils were rather widely dilated (about 6 mm. in diameter) and immobile to light as well as on convergence of the visual axes, and though appearing almost circular, on closer inspection a few posterior synechiæ were found. These had apparently formed while the pupils were in a state of dilatation. They were sufficiently eccentric in position to suggest that a mydriatic had been applied previous to their formation. This seemed all the more probable since on further examination it was found that her accommodation was apparently paralysed. There were well-marked punctate deposits on the back of both corneæ, and haziness of the vitreous. Through this fog the details of the fundus were rendered somewhat obscure, but no gross changes were to be seen at the disc or elsewhere.

R.V. = 5/60 not improved by any lens.
L.V. = 6/60 „ „

At 10 inches her vision was relatively worse. The right eye could

barely decipher J. 19. The left, J. 16, with + 4 D. sph. improvement was got to about J. 14. There was undoubtedly mydriasis, and there appeared to me to be certainly cycloplegia as well, though the turbid media made the precise degree difficult to determine. Despite most careful enquiry I could not elicit that she had been using any mydriatic drops or ointment nor handling any plaister or liniment or medicine which might have contained belladonna or any such cycloplegic. Her tongue was fairly clean, her appetite poor. The temperature did not appear to be raised. This association of irido-cyclitis with paralysis of the pupil and accommodation appeared to me so exceptional that I asked my friend, Dr. F. D. Boyd, the family physician, to see the patient. On March 13 she was admitted under his care to the Edinburgh Royal Infirmary. I requested that precautions should be taken to see that there was no possibility of her having access to any cycloplegic and that every possible means should be employed to ascertain by bacteriological examination whether the disease had a microbic origin. Two or three days after admission she developed bilateral swelling of the preauricular portions of her parotid glands. The cervical part of the parotids were less affected and no other glands in the neck were involved. The enlarged parotids were smooth, firm and only slightly painful on pressure or on yawning. Her temperature, which was 98·2° F. on admission and 99° the following morning, remained for the most part rather sub-normal, varying from 96·8° F. on several occasions in the morning to generally a degree more in the evening. The highest temperature recorded was 99·4° F. on the 19th—two days after having had a von Pirquet's cuti-reaction applied. On March 29, Dr. Fitzgerald, one of the pathologists to the Royal Infirmary, reported :—

(1) That she was negative to Wassermann's test ;

(2) That she was negative also to von Pirquet's cuti-reaction and that a subsequent injection of Koch's old tuberculin had also given a negative result ;

(3) That no growth had been obtained from the blood culture ;

(4) That the blood showed a leucocytosis ;

(5) That a culture from the conjunctiva showed Gram positive cocci (staphylococcus albus and citreus).

The Hospital notes do not definitely state whether any swab was taken from her throat. If it was done, it was certainly found negative. Unfortunately, her admission coincided with a change in the period of office of resident physicians and, owing partly to the pressure of war-time demands, there was some divided responsibility in the recording or neglect to carry out this observation. I could elicit no history or symptoms pointing to any ulcerated condition of the throat ; and I can only add that having myself taken a swab from her throat on May 12, it was reported by the Laboratory of

the Royal College of Physicians to contain no diphtheria bacilli. This is perhaps a rather belated observation. At the same time, knowing that long after an acute attack of diphtheria has subsided, bacilli may still be found in the throat, I give it for what it is worth. By April 7 the patient said that her eyes were improving. She could tolerate light with less discomfort, and the parotid swellings, though still obvious, had considerably diminished in size. On the following day, April 8, the patient was dismissed from hospital, i.e., nearly a month after her first visit to me.

On April 24 (i.e., six weeks after her first visit) I saw her again at my house. The pupils were now rather more oval, with longer axes horizontal. The parotid glands still felt slightly indurated on palpation between the jaw and ear, though there was now no obvious swelling. I think I may safely assert that they were not normal for fully a month and a half in her case. There was apparently some deficiency in the salivary secretion at this time, for she complained that she had difficulty in masticating and swallowing dry food unless she took some fluid with it; but the act of deglutition was not impaired and her speech was not nasal. There was much deep punctate keratitis, the spots having then that tawny colour which usually indicates recession of the exudate. The vision was as previously recorded.

About May 12 (ninth week) the vision was at its worst. The right fundus could no longer be seen. R.V.=fingers at 3-4 metres. L.V.=6/36 with difficulty.

Thereafter improvement set in. On May 30 she expressed the opinion that her vision for objects in the street and for the furniture in my room was returning, but the actual response to test types was practically unchanged. There was still much punctate keratitis, with floating opacities in the vitreous. I did not see her in the course of the summer, though I heard that she was getting better, and I had no further opportunity of examining her until November 9, when I found :—

V.=6/36. Improved with + 0·5 D. sph. to 6/24 partly in each eye.

With an effort, J. 6 was read at 10 inches unaided by glasses, and there was a visible narrowing of the pupils during this act of accommodation. The relative improvement in near vision was remarkable, and strongly supports the view that there had been profound cycloplegia earlier. When at rest, facing the light and looking directly forward, the pupils were circular, 5 mm. in diameter, i.e., a little smaller than formerly. There was no evident contraction even on exposure to focussed light, so that the ciliary muscles, aided by voluntary impulse, appeared to be regaining their action somewhat in advance of the reflex activity of the sphincters of the pupils to the stimulus of light. There was still considerable brown

punctate keratitis and pigment spots on the anterior capsules of the lenses, with floating opacities in each vitreous, but the optic discs could now again be seen, the right rather more easily than the left. There was no evident choroiditis.

On February 1, 1917, the whole condition had further improved. R.V. = 6/18. L.V. = 6/12 partly; while with each eye unaided she could now decipher J. 1.

My last examination was on April 19, when I found that with the right eye she could read 6/12 (save one letter) and J. 1, and with the left eye, 6/12 and J. 1 more easily. The pupils were equal and almost if not quite circular, especially the left. Each appeared about 5 mm. in width in subdued light and responded very little, if at all, even to brightly focussed light, but definitely narrowed to about 3 mm. on convergence with accommodation. She still had some fine brown spots of deep punctate keratitis on both corneæ, and on the lower part of the R. cornea, one larger grey, greasy spot composed of a small chain of more recent confluent deposits forming an incomplete ring about 2 mm. in diameter, shaped like a C or one of Landolt's vision test figures. The vitreous was practically free from opacity in both eyes; the optic discs were well defined and there were no visible choroidal changes to be seen even in the periphery of the fundus. Nothing abnormal was to be felt about the parotid glands; salivation appeared to be quite natural; the ciliary muscles had practically regained their power. On the whole she seems in a fair way to make a complete recovery, but it is now more than a year since the onset of the disease. No mydriatic has been employed in treatment—only dark glasses and tonics.

Commentary.—I must confess that when this case first came under my observation prior to the development of the parotitis, I was at a loss to explain the concomitance of irido-cyclitis and irido-cycloplegia. The subsequent development of bilateral parotid swellings at once suggested that the case was one of mumps, but even if so, it is unusual for eye symptoms to ***precede*** the parotid trouble. They usually follow as later symptoms. Perhaps I should say here, that the case was quite unlike either Parinaud's or Mickulicz's diseases.

Ocular complications of parotitis epidemica have been frequently recorded in medical and ophthalmic literature. Thus:—swelling of the lids; swelling of the lacrymal glands (for which Hirschberg has suggested the term "lacrymal mumps"); lacrymation; conjunctivitis; some rather dubious cases of keratitis; several cases of irido-cyclitis with keratitis punctata profunda, generally with vitreous opacities; optic neuritis; optic atrophy; paralysis of extra-ocular muscles with associated diplopia and some degree of exophthalmus; facial palsy involving the eyelids; and, more rarely, mydriasis and paralysis of accommodation. From most of these

complications the recovery has been satisfactory after a variable length of time, but optic neuritis may go on to optic atrophy and total loss of vision. In one case at least (Schiess-Gemuseus[1]), an irido-cyclitis took so unfavourable a course that enucleation was performed to lessen risk to the other eye, and this supplies the only pathological report which I have discovered. It is not very enlightening, but so brief that I can give it in eight words:—"Iris extraordinarily thickened, peculiar pulpy tissue, much vascularization." In addition to the ocular complications following mumps, which I have above mentioned, there are of course many other grave complications. Paralysis of various parts of the central nervous system, involving both motor and sensory functions, has been recorded. I am not at present concerned to discuss these and refer to them only as an indication of the fact that, though in the great majority of cases mumps is regarded as a harmless affection, it may be accompanied by complications which are, temporarily at any rate, of a serious nature. But, again, the question arises whether my case was truly one of mumps at all.

In that connection I should like to draw attention to a paper published in 1909 by Heerfordt in v. Graefe's *Archiv für Ophthalmologie*, Vol. LXX., p. 254, entitled "On a Sub-chronic Uveo-parotid Fever, localized in the Parotid Gland and the Uvea of the Eye and specially complicated with Paresis of Cerebro-spinal Nerves." Heerfordt records three separate cases which occurred under the care of different physicians in the Copenhagen Town Hospital in the years 1905-6. The first, a boy of eleven; the second, a boy of fourteen; and the third, a manservant of twenty-seven years.

They were all cases in which *without any known history of exposure to mumps*, but after experiencing for some weeks feelings of tiredness, drowsiness, loss of appetite and so forth, parotid swellings developed associated with irido-cyclitis and various pareses of nerves. In the first and youngest of the trio, there were symptoms of pyrexia sufficiently pronounced to justify the employment of the term "fever" to which Heerfordt gives prominence in his title. During his stay in hospital for four or five months, this boy's temperature varied from three to four degrees above normal. In each of the other two patients there was less fever—only a very slight but protracted tendency to pyrexia.

The circumstances which seemed to justify the grouping together of these three cases were that, whereas in mumps (1) the premonitory stage is usually brief (12 to 36 hours), in Heerfordt's cases it varied from a fortnight to many weeks; (2) the parotid swelling, which usually subsides in two to eight days and may exceptionally continue for two, three or even four weeks, was noted in his cases for more than two months; (3) the increased temperature, which

commonly varies with the severity of the attack, is not usually of long duration in mumps, and often falls suddenly by "crisis." In his cases it was not high, but more protracted. (4) In the first case, irido-cyclitis and optic neuritis *preceded* the parotid swelling by about a week. In the other two, the ocular and other nerve symptoms *followed* after parotitis. Thus in the second boy there was irido-cyclitis first in the right eye and later in the left, a transient right facial palsy, and for three weeks after admission difficulty in swallowing food.

The third patient (man of 27) complained of feeling out of condition and tired for some months before his admission to hospital. The parotid glands then became swollen, double irido-cyclitis developed and other nerve symptoms followed, difficulty in swallowing, right facial palsy and disturbances of sensation in the skin of the abdomen and hands, and diuresis. There is no record of cycloplegia in any of this trio. Nor is there any record of diphtheria in either of the boys, but the report on the man concludes with the remark that diphtheria bacilli were found in the fauces. On this point Heerfordt makes no further comment, but came to the conclusion that if his cases were due to mumps, they were very atypical and he raised a question whether they ought not to be assigned to some hitherto unrecognized category, constituting a separate clinical entity.

In his survey of the literature Heerfordt fixes on two cases which he considers should be grouped with his own. The first concerns a military musician, aged 22, seen in 1897 by Daireaux[2] and Péchin[3] eleven days *after* a bilateral parotitis, diagnosed as mumps, though there was apparently no epidemic of that disease at the time. He developed right facial palsy and loss of taste on the right side. This cleared up in about a month, but a week or two later a double iritis with some keratitis followed. The other case published by Collomb[4] appears to me to be of greater interest since ocular trouble *preceded* parotitis. An apparently healthy man of 29, after some digestive disturbance, developed redness of his right eye. When first seen by Collomb a few days later he had parotid swelling and irido-cyclitis combined with hyperæmia of the disc. This was followed by a slighter attack in the left eye. In this case, so far as known, there was no exposure to epidemic parotitis.

In 1916 Kuhlefelt[5] reported "a case of sub-chronic uveo-parotid inflammation" in a Finnish journal published in the Swedish language at Helsingfors.* This is a case of a female clerk, aged 21, who consulted him on August 20, 1915. Her father died of tuberculosis. She had mumps as a child. In adolescence an affection of the fourth metacarpo-phalangeal joint of the right hand.

* I am indebted to Dr. Kuhlefelt for kindly sending me a copy of his paper, and to Sir George Berry for a translation of its contents. The translation will be found on p. 621.

In July, had some swelling and tenderness in each parotid region followed by diminution of vision in the right eye. In the middle of August, complained of dimness of vision in the right eye and injected conjunctiva, Descemetitis, hyperæmia of the iris, media otherwise clear, but apparently neuro-retinitis with some turgid vessels, circumpapillary greyness and eccentric retinal hæmorrhages. V.=5/10. She evidently had irido-cyclitis with neuro-retinitis in the right eye, but no cycloplegia. Occasionally slight rise of temperature. She had apparently not been exposed to epidemic parotitis. The left eye was normal.

In the *Lancet* of January 6, 1917, p. 28, there is an editorial note on a paper by Leeksma, of Heukelum, published at Amsterdam last year, with reference to a married woman, aged 28, who after feelings of tiredness, some shivering and night sweats, developed pain in the left ear and then right facial paralysis. A week later, the left parotid gland became swollen. A fortnight later, the facial palsy cleared up, but was followed by herpes of the left cornea and that again by irido-cyclitis. There was apparently no cycloplegia. On enquiry Leeksma found that there were three typical cases of mumps in this patient's environment during the middle period of her illness (January to March), and he came to the conclusion that while his case resembled Heerfordt's, uveo-parotid fever is nothing more than atypical mumps and not a separate morbid entity.

I have myself made a fairly careful analysis of the papers referred to by Heerfordt in his communication of 1909, and have searched through the *Index Medicus* from that date up to the present time, and have found details of only six cases of dilated pupils and paralysed accommodation recorded in association with parotitis. In three of these, the irido-cycloplegia appeared to be a secondary consequence of optic neuritis or optic atrophy, or as part of a third nerve paralysis, namely, in cases published by Talon[6] in 1883, Swan Burnett[7] in 1886 and Blanchard[8] in 1899. Of the remaining three cases the first, published by Baas[9] in 1886, was a little girl, aged 7 years, who had cycloplegia three weeks after mumps. Diphtheria was excluded. The second, reported by Mandonnet[10] in 1903, was a child of nine with complete paralysis of accommodation and of the soft palate after mumps. The third, recorded by Dopter[11] in 1904, was a guardsman, aged 31, who, two or three weeks after mumps, which quickly subsided, developed pyrexia, occipital headache and double orchitis, left facial palsy, paresis of left half of tongue and soft palate, left mydriasis and left cycloplegia. He had definite leucocytosis and made a good recovery. In none of these was there irido-cyclitis.

I have found no record of a case exactly reproducing either the group of symptoms or the order of their occurrence which characterised the one under my own observation.

One must not overlook the fact that inflammation of the parotid gland is a not very uncommon complication of various septic medical and surgical conditions, e.g., typhoid fever, appendicitis and abdominal operations. This gland is a channel for the excretion of deleterious material. Various drugs make their escape by the saliva, and abundant salivation is a common precursor and accompaniment of bilious vomiting. The ciliary body doubtless plays its part also in endeavouring to get rid of deleterious substances circulating in the blood stream. It appears to me not improbable that the obstinate and tedious character which iridocyclitis so often presents, is due to the fact that the morbid material passing from the ciliary gland into the aqueous fluid has no chance of being directly evacuated from the body like the saliva, but is necessarily reabsorbed into the circulation and sets out again in a vicious circle. It is commonly believed that in mumps the poison enters the parotid gland through the buccal orifice. If that be so, it is easy to understand how the parotid gland reaction precedes other signs and symptoms of remote or metastatic inflammation or nerve pareses, which are presumably due to an extension of the poison through the system, or are set up by toxins produced by the primary infecting agent. When remoter toxic effects precede the parotitis, I venture to suggest that the poison, whether due to mumps or not, may (or must) have entered by some portal other than Stenson's duct. The possibility of a mixed infection, e.g., with diphtheria, should not be put aside without further careful investigation.

Bearing all these problems in mind, there is undoubtedly some justification for Heerfordt's scepticism as to whether there may not be another ætiological factor than mumps for cases such as he and I have recorded, in which no association with mumps has been established. This problem cannot be correctly solved until pathological investigation has determined what is the precise cause of mumps as certainly as it has revealed the cause of anthrax or tetanus or diphtheria. Personally, I shall suspend judgment and, adopting the cautious procedure of our Scottish Courts, go no further than to say that the case for mumps as the sole cause for uveo-parotitis is as yet, " not proven."

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TRANSLATION

A CASE OF SUB-CHRONIC FEBRILE UVEO-PAROTID INFLAMMATION*

BY

Dr. E. KUHLEFELT

IN the *Ugeskrift for Laeger* No. 16-17, 1909, Heerfordt gives an account of one case observed by Daireaux and Péchin, one by Collomb and three by himself of an affection which in many respects resembles epidemic parotitis. As these cases, however, show several important deviations from even atypical epidemic parotitis, Heerfordt considers that they should be relegated to a different group which he proposes to call "febris uveo-parotitis subchronica."

With one exception these cases occurred at times when there was no epidemic parotitis. All the patients were healthy and free from hereditary taint. The disease lasted from three to nine months, of which the prodromal stage occupied at the least some days, and at the most a few months. The symptoms of the prodromal stage resembled those which usually precede an attack of typhus (enteric ?). The accompanying fever was, as a rule, slight, and not subject to much change, but in some cases there were exacerbations which did not always completely coincide with the outbreak of localized changes. These changes, of which the uveitides, which always occurred, deserve special notice, occurred primarily in the parotid in some, and in the uvea in others. No other glandular changes were observed. (In a case which Schou published later, there was a simultaneous swelling of the lacrymal gland.) Though varying somewhat in degree the parotitis was in all cases of a mild

*Taken from the *Finska Läkaresällskapets Handlingar*, redigerade af DR. RICHARD SIEVERS. Band LVIII, May, 1916, pp. 867-870.

type. In one case structures resembling papules were found on the iris. (In Schou's case there were nodular prominences on the iris.)

The complications observed by Heerfordt in epidemic parotitis were only pareses of cerebral nerves, joint affections and optic neuritis. While the last was only an exceptional complication in epidemic parotitis, it occurred in several of the cases described by Heerfordt. Pareses seemed also to be more frequent in febris uveoparotida than in parotitis epidemica. Besides the complications already mentioned, there was one case in which there were disturbances of sensibility and of reflexes and increased diuresis. As I have had occasion to observe one case of this unusual disease I give a short account of it:

Miss E. L., clerk, aged 21, from Helsingfors came to see me for the first time on August 20, 1915. *History*:—The father died of tuberculosis, but there were no other cases in the family. Lues could be excluded in both parents and patient. Parotitis epidemica as a child. In adolescence some affection of the fourth metacarpo-phalangeal joint of the right hand. Patient was not aware of having been in contact with anyone sickening for any illness. Since July, swelling and tenderness in each parotid region. Diminution of vision in the right eye August 15; August 18 last joint of left little finger, head and eyes painful. Feels tired. Has not noticed any symptoms of fever or of weakness or disturbance of taste or sensibility.

Status presens:—Delicate, thin, anæmic (hæmoglobin *ca.* 75 per cent). Acute laryngo-bronchitis, but no demonstrable changes suggestive of tuberculosis. Apices alike and clear (Prof. Talqvist). Urine free from sugar and albumen on repeated examinations. No symptoms indicative of sinusitis (no mucus or pus from maxillary or sphenoidal sinuses). Preauricular portion of each parotid somewhat swollen and tender. The right retro-maxillary portion nearly the size of an infant's hand, the left somewhat tender and uneven pigeon-egg sized; surrounding parts not swollen. Nothing abnormal in mouth or throat. Sublingual, submaxillary and lacrymal glands neither tender nor swollen. No tenderness in the region of the ovaries.

R.E. Conjunctiva oculi somewhat injected, small deposits on the lower part of Descemet's membrane, iris a little hyperæmic. Media clear, papilla and retina over a wide circumpapillary area grey, turbid and swollen; blood-vessels invisible at places; veins swollen and tortuous; numerous large and smaller hæmorrhages and grey patches in the inner and lower quadrant of the fundus. V.=5/10. L.E. normal condition. Last joint left little finger swollen and tender.

Tactile sensation normal everywhere; sensation of pain slightly blunted in places (left upper arm), otherwise normal; left patellar

reflex not easily elicited, reflexes otherwise normal; no demonstrable pareses.

Treatment and Course:—August 20. Aspirin, sweating, atropin.

August 23. Pupil fairly well dilated, though irregularly; iris swollen; exudation in pupil. No details of fundus visible. V.=fingers 1.1 metre. Admitted to hospital. Aspirin, sweating, inunction.

August 29. L.E. Pericorneal injection, some iris congestion.

September 1. L.E. free from irritation. Swelling and tenderness right great toe.

September 12. Left hospital.

September 17. Swelling of parotids, which had diminished lately, increased a little, particularly the right. Little finger well. Iritis passing off, details begin to show in fundus. V.=fingers at 1.5 M.

September 28. Right parotitis rather increased lately. Iritis gone. Papilla better seen, with four faint-grey, segregated large retinal vessels visible. V.=fingers at 2.5 metres. Atropin and inunction stopped. Collo-iodide and sweating.

October 8. Margins of papilla visible, surrounding retina light grey; in the macular region small grey patches and pigment; inner and lower quadrant of fundus worm-shaped grey patch stretching from papilla far out to periphery, where it branches into two. V.= fingers at 4 metres. Great toe well.

October 18. Sweat cure discontinued. Iron.

October 28. Papilla pale, papillary vessels in the main visible, surrounding retina normal in appearance, in the macular area there remain only the pigment patches, the worm-shaped patch is white. V.=fingers at 5 metres. Swelling in parotid glands markedly reduced. General condition rather better. Collo-iodide discontinued. Arsenic.

The temperature has varied in the mornings between 36.2° and 37.3° C., and in the evenings between 36.3° and 37.4° C. There have been four definite rises of short duration, the maximum in the first being 37.7° C., in the second 37.7° C., in the third 37.5° C. and in the fourth 37.9° C. Possibly the first of these was connected with the iritis in the left eye, and the second with an exacerbation of the right-sided parotitis. In the third and fourth, there was neither exacerbation of localized symptoms nor the occurrence of anything fresh.

The diuresis while in hospital was 1,100 to 1,950 c.cm. per 24 hours. The case occurred at a time when there were in the patient's neighbourhood only isolated cases of epidemic parotitis. (In Helsingfors three in June, four in July and not a single case in August were notified.) So far as is known, too, the disease was not transmitted to anyone else.

G. A. BERRY.

ANNOTATIONS

The Royal London Ophthalmic Hospital Reports

The final number of the *Royal London Ophthalmic Hospital Reports* made its appearance in July last. It contains an epilogue and an index to Volume XX, together with a general index to volumes XII to XX, covering the years 1890-1916. The epilogue, quoted in full below, is couched in most sympathetic strain:

EPILOGUE.

"As our readers know, the *Royal London Ohthalmic Hosbital Reports* ceased publication with the present number. Together with the *Ophthalmic Review* and the *Ophthalmoscope* they merge into the new BRITISH JOURNAL OF OPHTHALMOLOGY, which commenced its career in January of this year. We need not, therefore, bewail their loss as an annihilation, but rather regard them as undergoing a metamorphosis and a rejuvenescence.

In bidding them farewell in their old familiar form, it is natural that we should glance back over their long and eventful history. Established in 1857, they have reached their diamond jubilee. It was a remarkably fertile period in the history of ophthalmology when the *Moorfields Hospital Reports* were born. Von Helmholtz, von Graefe, Donders, Bowman, and William Mackenzie were in the zenith of their activities. Only a few years had elapsed since the ophthalmoscope had been re-discovered by Helmholtz (1851), and introduced to clinical use by von Graefe and his pupils. Modern ophthalmology was born in those days, and the *Reports* were one of its first products. Sir William Bowman's name is indelibly associated with the dawn of the new era in England, and it appears in the first number of the new journal. For it was from the start a journal rather than a mere collection of reports of hospital cases. At that time there was no English periodical publication devoted to ophthalmology, and there was no Ophthalmological Society. Moorfields Eye Hospital, to give it its familiar and time-honoured designation, was the unique centre of British ophthalmology, and at once became the heart and soul of the new movement. Hitherto those of our surgeons who were interested in diseases of the eye had been forced to contribute their observations to the general medical journals, such as the *Lancet* and the *Medical Press*. They must have often felt that their more recondite communications on ophthalmic subjects made little appeal to the readers of these periodicals, and were buried in them and liable to be overlooked and forgotten. In such cases they had no recourse open to them but to publish in the long-established *Annales d'Oculistique*. The *Moorfields Reports* provided them with a new medium. It is true that, from the beginning, original articles appear to have been

accepted only from those who had worked at the Hospital, but there is little evidence of disadvantage accruing from this fact. Thus we find communications in the early volumes from such men as William Mackenzie, the greatest ophthalmic clinician of pre-ophthalmoscopic days, Sir William Bowman, George Critchett, J. W. Hulke, Sir Jonathan Hutchinson, Dr. Hughlings Jackson, T. Wharton Jones, George Lawson, Henry Power, Argyll Robertson, J. F. Streatfield, Pridgin Teale, Spencer Watson, Soelberg Wells, J. C. Wordsworth, and many others. Certainly in later days the rule was strictly observed, and the list of contributors to the twenty volumes of the *Reports* is one of which any hospital may well feel proud. It is unnecessary to enumerate other names of world-wide renown, but it should not be forgotten that Edward Nettleship published much of his finest work in these pages. The widespread influence of the Moorfields teaching is exemplified by papers which bear the names of J. W. Barrett, of Melbourne, and of Americans such as Webster Fox and Casey Wood.

With the third volume, in 1860, the *Reports* assumed still more the character of a journal by the addition of a "periscope" of current ophthalmic literature. This feature was discontinued after vol. ix (1877).

It has often been held up as a reproach to British ophthalmologists that they neglect the more purely scientific aspects of their subject. It finds little support from the contents of these *Reports*. Valuable papers on applied optics have been written by G. Rainy, W. Charnley, A. H. S. Hallidie, and others. Pathological anatomy has always been a conspicuous feature, and, indeed, the *Reports* owe much of their success to the energy and enthusiasm of successive Curators—C. Bader, E. Nettleship, W. A. Brailey, W. J. Milles, J. B. Lawford, E. Treacher Collins, C. Devereux Marshall, W. T. Lister, J. Herbert Parsons, G. Coats, A. C. Hudson, and R. A. Greeves.

The more recent volumes are fresh in the memories of readers, and their contents can be revived by a perusal of the general index published in this number. It is of interest to recall some of the earliest papers. The second volume is particularly interesting. There we read of night-blindness with scurvy in the Crimea, and on p. 42 it is stated that "in 1855 there were upwards of seventy cases of scurvy on the 'Euryalus.'" One of our staff is now serving on the "Euryalus" of to-day. There, too, we read William Mackenzie's observations on retinitis associated with renal disease, conical cornea by Bowman, with Hulke's microscopical examination, a note on persistent pupillary membrane by Wharton Jones, and so on. We can still learn a lesson from Streatfield's note on coloured papers, in which he describes how Babbage, the inventor of the ophthalmoscope, experimented to ascertain the best colour for the

paper on which to print his logarithmic tables. The early volumes contain Soelberg Wells's papers on paralytic affections of the muscles of the eye, and Jonathan Hutchinson's on syphilitic inflammations of the eye. Here, too, are Hughlings Jackson's papers on defects of sight in diseases of the nervous system. In vols. iii and iv he finds chiefly optic atrophy; in vol. iv he distinguishes between nerve atrophy (primary) and cerebral atrophy (post-neuritic); in vol. viii he publishes two cases, one of cerebral tumour without optic neuritis, and another of double optic neuritis without cerebral tumour.

And so we may bid farewell. The familiar brown-covered parts will no longer be seen. The spirit which gave them birth sometimes flagged, but never died. It is not dead now, but re-kindled into a newer and livelier flame. *Le roi est mort*! *Vive le roi*!"

The War Activities of an Ophthalmological Society

An interesting account of the work accomplished by the Ophthalmological Society of Paris during the war is given by Rochon Duvigneaud in the *Annales d'Oculistique* of July last.

The Society has been by no means idle in the period under review. In October, 1914, it addressed a letter to the authorities asking for a better distribution of wounded soldiers in the special hospitals of Paris, and furnished the necessary information dealing with this subject. A second letter was sent to the Minister of War, advocating the advantages of introducing cylindrical lenses into the optical correction allowed to soldiers: shortly afterwards a ministerial decision was promulgated to the effect that astigmatism was compatible with service in the field when the visual defect was adequately compensated by cylindrical glasses. In 1916 the Society recommenced its regular meetings, compensating the absence of such of its members as had been mobilized by the admission to its meetings of ophthalmologists, native and allied, who were stationed in Paris, as Bourgeois, Moreau, Genet, Roy (Canadian Army), Quentin, Coulomb, etc.

In April and July, 1916, and in May, 1917, the Society devoted three meetings to the discussion of war subjects. The importance of these meetings was recognized by the authorities, as shown by the fact that they were presided over by M. Justin Godart, the Under Secretary of State of the Military Sanitary Service, who was accompanied by his medical staff. The Society is at present organizing another of these meetings, to be held during the ensuing winter. The participation of all mobilized ophthalmologists is invited. The titles of communications must be submitted, through the Society, to the Under Secretary of State, who will be asked to preside over the meeting.

Meanwhile the ordinary meetings of the Society were largely taken up with military subjects. The special war meetings included the discussion of the organization of the military ophthalmological services the correction of errors of refraction, and the prevention of war injuries of the eye; in a word, anything that had a bearing upon prevention. They also included medical and surgical pathology, medico-legal questions, and the problems surrounding those blinded in the war. Briefly, the Society undertook everything in its power to repair the damage caused by war, therapeutically, morally, or pecuniarily. In March, 1916, the Society transmitted to the Minister of War a report advising certain changes in the military regulations concerning the visual requirements of soldiers, pointing out the number of men whose sight could be brought to the required standard by the employment of sphero-cylindrical glasses. The Society next demanded that all ophthalmic surgeons mobilized should be employed in the pursuit of their speciality, and not be distracted by duties incidental to the exercise of general medicine and surgery. The Society took up the question of the lenses and mountings needed for a given number of men, and suggested that the sight and refraction should be entered upon the soldier's record. It also gave all the information necessary for the efficient working of centres where glasses might be obtained by ametropic soldiers. The Society has also done good work in protecting the eyes of the soldiers against injuries inflicted by small particles of low penetrative power. Various protective appliances have been devised by its members, as Terrien and Cousin, Monthus, Morax and Moreau, Polack, and Dunant. The problem, however, has yet to be solved. Among other important subjects studied and discussed by the Society may be mentioned the repair of wounds of the face and of the eye, the early treatment of wounds of the eye and eyelids, the management of cicatrized wounds of the eyelids and the orbital cavity, questions surrounding the wearing of an artificial eye, intra-ocular foreign bodies, the relationship between wounds of the cranium and disorders of sight, injuries by "windage," night-blindness, and factitious disease, as well as simulated defect of sight, to say nothing of such medico-legal questions as the estimation of the degree of invalidity caused by hemianopsia.

Altogether, the record of the Paris Ophthalmological Society is one to be emulated by similar bodies.

The Welfare of the Blind

The Departmental Committee on the Welfare of the Blind, appointed early in 1914 by the then President of the Local Government Board, has issued its Report. It is of interest to note that the Chairman of the Committee, the Right Hon. W. Hayes Fisher, M.P.,

is now the President of the Local Government Board. The labours of the Committee were temporarily interrupted by the outbreak of war, and the "European situation precluded the Committee from pursuing the investigation of the condition of the blind in other countries."

The Report is one which merits the earnest attention, not only of the Government to which it is submitted, but of every thoughtful member of the community and especially of those intimately concerned with the care and education of the blind, and with the prevention of blindness.

The lamentable fate of the reports and recommendations of former Government Committees on subjects of equal importance is only too well known, but it seems scarcely conceivable that a Report so pregnant with far-seeing and practical suggestions as is the one before us should fail to obtain the recognition which it deserves.

The terms of reference from the Local Government Board were: "To consider the present condition of the blind in the United Kingdom, and the means available for (*a*) their industrial or professional training, and (*b*) their assistance and to make recommendations."

Acting on these instructions, the Committee has directed its attention chiefly to questions concerning the welfare of the blind. The causes of preventable blindness and measures for its prevention have not been neglected, however, and sections III and IV of the Report contain the opinions of the Committee upon ophthalmia neonatorum, occupational blindness and the education of myopic children.

The "recommendations" of the Committee are far reaching and thorough, and the attentive reader of the Report will share the conviction of the Committee that "if our recommendations are adopted, the proportion of the blind to the population will be gradually and permanently reduced." Although these recommendations concern chiefly the care and education, both scholastic and industrial, of those already blind, they include measures for the prevention of blindness from ophthalmia neonatorum and from avoidable accidents in dangerous occupations which, if carried out effectively, would do much to lessen the number of persons blind or partially blind from these causes.

We propose to deal with the Report more fully in a future number of the Journal.

ABSTRACTS

I.—FOREIGN BODIES IN THE EYE AND ORBIT

A systematic analysis of the Discussion held during the 1916 Session of the Ophthalmological Society of the United Kingdom.
(*Transactions*, Vol. XXXVI, pages 63 to 137.)

This somewhat long discussion on foreign bodies in the eye and orbit, with special reference to prognosis and treatment, is of very great importance as representing the ideas at the present date of leading British ophthalmic surgeons. As in all such discussions, it is difficult to remember the various points made by the various speakers, with the result that one does not easily realize the actual trend of the prevailing views on each particular subject discussed. It has therefore been thought worth while to make an analysis based, not so much upon the speakers, as upon the subjects touched on by them. Looking over his notes—which are somewhat voluminous—the reviewer considers that the following are the chief headings under which most of the matter can be brought, although he does not pretend that the order he has selected represents necessarily the order of importance: (1) prognosis and treatment in general; (2) localization; (3) the various magnet types and their use; (4) the route selected to reach the foreign body; (5) siderosis; (6) sympathetic disease; (7) peculiarities of military cases; (8) references to the compensation of workmen.

The discussion was introduced by **A. L. Whitehead** (Leeds) and **J. Herbert Parsons** (London). It is not intended here specially to differentiate these two speakers from the others.

I.—Prognosis and treatment in general

Whitehead.—Prognosis and treatment depend upon (*a*) the presence or absence of sepsis: glass and porcelain and also pieces of metal are frequently aseptic; (*b*) size of the foreign body; (*c*) site and depth of the foreign body, the prognosis being good in inverse proportion to the depth; (*d*) the nature of the foreign body. Non-magnetic bodies are difficult of removal unless visible from the front. Glass may remain for many years without symptoms; it may become encapsuled, but, if in the vitreous, cicatricial changes and retinal detachment may result. Copper is always bad unless it be embedded in the lens.

Magnetic bodies are taken up under heading III.

With regard to the question of removal of the eye, Whitehead's rule is to enucleate if there is no vision and a foreign body is suspected.

In industrial work goggles are a prophylactic measure, but are not welcomed by the worker, because, if made of wire,

they interfere with vision by their nature, and, if made of glass, they become pitted and interfere with vision.

Parsons.—Problems of prognosis and treatment centre round the smaller missiles, since large bodies at high velocity destroy the eye. Since $E=\frac{1}{2}mv^2$ a small foreign body must have enormous velocity to penetrate the eye. Metallic bodies are more often sterile than non-metallic because the former are more often hot when emitted.

The influence of the nature of the foreign body on the pathological condition set up is profound and varied. Thus copper causes suppuration in the absence of organisms (Leber), leucocytosis being set up by chemical action. The suppuration may be delayed for some time by a wall of inflammatory material. Copper in the lens may cause little reaction. Wagenmann reported a case in which a fragment of copper remained in the lens for 27 years; ultimately cataract formed, and the copper was removed with the lens, being found in the nucleus. Only very rarely does copper become encapsuled with restoration of useful vision. Metals other than iron and copper usually remain quiescent; lead becomes coated with carbonate. Stone is chiefly dangerous from infection. Glass and porcelain may cause little reaction but eventually there is irido-cyclitis and disorganization of the eye. The most common infective organism is probably the pneumococcus.

Speaking of magnetic foreign bodies, Parsons recalled Goulden's order of prognosis, which the reviewer tabulates in the following order of progressive deterioration of prognosis:—

viâ the cornea, lens intact, vitreous not reached.
„ „ lens injured „ „
„ „ lens intact, vitreous reached.
„ „ lens injured „ „
„ sclera

Parsons makes it a strong point that while a wound of the lens always makes the prognosis worse, this is more particularly the case in children. The large amount of swelling readily results in anterior synechia and glaucoma, while the risk of sympathetic (already great in children, *vide infra)* is also increased. As bearing on the general question of prognosis, Parsons quotes Hildebrand regarding the frequency of the various routes taken by the foreign body to reach the vitreous, namely:—

(1)	through cornea, pupil, and lens ...	6 cases.
(2)	„ „ iris, and lens ...	16 „
(3)	„ „ iris, and zonule...	6 „
(4)	„ sclera	15 „
	Total	43 cases.

Foreign bodies on or in the retina may become encapsuled: this depends on asepsis. The retina may degenerate and become

detached. Encapsulation is often rapid with iron, and useful vision may persist indefinitely, but particles more than 1 to 2 millimetres in diameter almost invariably destroy the eye either by sepsis or siderosis.

Craig (Belfast).—The speaker was emphatic on the importance, from the prognostic standpoint, of early treatment. He made it a rule to see the patient on the day of the accident. The foreign body is much more difficult to extract if sufficient time has elapsed for the formation of fibrinous effusion or organized blood clot, so that the body becomes incarcerated. When a foreign body is in the lens Craig would extract through a radial incision if steel, but, if inert, he would leave it alone and wait. He mentioned that he had seen cilia carried into the eye comparatively frequently, a fact which was commented on by Whitehead, in replying to the discussion, as perhaps due to the long eyelashes of the Irish.

Gray Clegg (Manchester) contributed largely to the discussion. He had tabulated all the cases coming under his care in the Royal Eye Hospital, Manchester, as in-patients, with an actual foreign body in the globe or its coats or in the orbit, from 1900 to 1915. From this table (which is reproduced *in extenso* in the *Transactions*) the following points bearing upon prognosis emerge:

Of all in-patients 2·2 per cent. have a foreign body in the eye or orbit.
Of all out-patients 0·125 per cent. „ „ „
Of all accident cases 0·51 per cent. „ „ „

Of the 130 cases tabulated the following shows the position of the foreign body:—

Cornea	9	Retina	1
Sclera	5	Choroid	4
Anterior chamber ...	11	Lid	1
Iris	6	Ethmoidal cells ...	1
Posterior chamber ...	1	Orbit	8
Lens	12		
Vitreous chamber ...	71		130

Clegg discussed at considerable length the various factors which influence prognosis. Only one or two points can here be specially mentioned. One is as to the treatment when the lens is wounded, a grave factor in the prognosis. It is a moot point, he said, whether it is wise to express injured lens substance, either through the wound or through any corneal section that has to be made at the time of the removal of the foreign body. He was inclined to think that the least possible disturbance the better in the removal of the body, and that further operative measures should be left to a later stage when the eye is quiescent. Then, again, with regard to possible damage done by the giant magnet, Clegg pointed out that this magnet has no power of discrimination, and that the foreign body, in its passage out of the wound, or from the vitreous chamber,

may quite easily tear the ciliary body or iris or wound the lens. Large foreign bodies nearly always result in loss of the eye. Clegg then discussed the diagnosis of small bodies. His remarks on treatment are devoted, it seems to the reviewer, practically wholly to metallic foreign bodies, and, of these, to magnetic bodies. This part will therefore be referred to under the heading "Magnet." He spoke also of the various ways in which an eye may be lost, and mentioned the use of vaccines in suspected purulent uveitis.

Arnold Lawson (London).—Lawson confined his attention to the questions of the management of foreign bodies in the vitreous and the anticipation of sympathetic. The latter will be taken up under the heading "Sympathetic." Regarding vitreous foreign bodies, he considered that when these are magnetizable no difference of view arises. The chief problems arise in connection with non-magnetizable bodies. Speaking generally, it is advisable that such a body should be removed, but the difficulty and risk are great. Except copper and some others, non-magnetizable bodies are less irritating than magnetizable. Aseptic bodies may remain in the vitreous for an indefinite time, especially if other than iron (or steel) or copper. If destructive changes result from a non-magnetizable body in the vitreous, a decision will be easily come to, but, if the reaction is not great, and there is useful vision, palliative treatment and a "wait and see" attitude are justified.

Bernard Cridland (Wolverhampton). — Cridland presented statistics bearing on the prognosis, and drew certain conclusions from them. The reviewer, however, noticing that some error had crept in as regards the conclusions, got into touch with the author, and here presents the conclusions as they should be, not as they are actually set down in the *Transactions*.

The statistics cover a total of 43,000 accident cases in 13 years at the Wolverhampton Eye Infirmary (military cases excluded). The number of cases in which a foreign body entered and remained in the globe is 76 ***plus*** one case not yet completed. It will be noted that the percentage of penetrating bodies to total accidents is only 0·17 per cent. It will be convenient to reproduce the table of cases, in a modified way:—

Vitreous	36 cases	12 eyes saved	24 eyes lost
Lens...	12 „	10 „	2 „
Post. scleral wall ...	11 „	4 „	7 „
Anterior chamber ...	11 „	10 „	1 „
Ant. scleral wall ...	3 „	2 „	1 „
Iris	1 „	1 „	0 „
Posterior chamber ...	1 „	1 „	0 „
Orbit (eye also injured)	1 „	1 „	0 „
	76	41	35

From the foregoing statistics Cridland concludes that the situation of best prognosis is the anterior portion of the eye, i.e., in the anterior or posterior chambers, iris or lens, and that of these the lens is the worst. The second best situation is the posterior scleral wall, with a percentage of 36.27 eyes saved. The worst situation is the vitreous, with a percentage of 33.3 eyes saved. To leave the fragment in the vitreous is, in Cridland's opinion, always disastrous; in the posterior scleral wall it is less dangerous. Speaking generally, unless a fragment is either in the posterior scleral wall or in the lens, it must be extracted at almost any cost, or the eye is lost.

Hern (Darlington) had watched cases where glass or stone was lodged in the vitreous for twenty years. The following sentence does not, as it stands, seem quite compatible with Hern's previous statement (p. 132) that glass and stone were the two substances he was most inclined to leave in the eye, namely, "But if it were iron or a non-magnetizable body, and particularly if it were copper, he felt certain that the eye would go wrong; not only would the sight be lost, but the eye would be a menace to the other one." Perhaps the author here intended to confine the statement to non-magnetizable *metallic* bodies, for immediately afterwards he said, "in such cases his practice was to try to locate the body and make an incision as near as he could to it, and, at all hazards, get it out." If this applied to glass or stone it would be a contradiction of the previous statement. Hern agreed with some previous speakers that the foreign body should be removed as soon as the case was seen.

John Rowan (Glasgow) had, like Hern, observed stone lying harmlessly in the eye for years.

George Mackay (Edinburgh) emphasized the importance of early treatment. Fibrin or leucocytes soon gathered round a foreign body. He had seen, as also doubtless had others, cases in which a magnetizable body, in the moment of extraction, left its mantle of exudate as a floating opacity in the vitreous.

Whitehead, in his reply, said he agreed with Craig and others in laying much importance on immediate treatment. He regarded the first twelve hours after the accident as vital, because after that there was a likelihood of incarceration taking place, or at least the throwing out of lymph around the foreign body.

II.—Localization

Whitehead, in his opening paper referred to the subject of localization of the foreign body, with special reference to those which are magnetic. In some cases the body can be seen by direct inspection, in others the localization is assisted by noting the point of penetration, and, where present, the corresponding wound of the iris or lens. Where the penetration has been behind the lens, the

body can sometimes be seen ophthalmoscopically. A magnetic needle working on the principle of a galvanometer may be used to detect the presence of a small magnetic foreign body. (No further reference to the sideroscope was made by this or any of the other speakers.—E. T.). Localization by X-rays is the most valuable method of all. (Whitehead, assuming that J. Mackenzie Davidson would speak, left the discussion of X-rays to him. Unfortunately, Davidson does not seem to have taken part in the discussion.) The telephone probe would not be of much assistance in the eyeball itself, but in the orbit might be of great value.

Stephen Mayou (London) at a later stage of the discussion referred to a combination of the magnet with the telephone probe (see under "Magnet.")

Parsons in his opening paper, said that the surest test, skiagraphy, had severe limitations, because relatively few substances are opaque to X-rays. Yet the great majority of intra-ocular foreign bodies give a good shadow because the great majority are metallic. Glass is not usually visible unless it be lead glass. Accurate localization by X-rays is essential, and the only accurate method of which Parsons had had experience is that of J. Mackenzie Davidson. "When it is remembered that accuracy of localization of the order of 1 mm. is essential, and that inaccuracy of this amount may lead to the needless sacrifice of an eye, it will be recognized how culpable any carelessness in this respect is. . . An ordinary X-ray photograph may demonstrate the presence of a foreign body, but it is practically useless for any but a very gross type of localization."

Craig regarded accurate localization as one of the most important items of treatment of foreign bodies in the vitreous, but it was his opinion that unless the localization of a foreign body by X-rays could be secured without much delay, the patient would have a much better chance, as regards ultimate prognosis, by extraction of the body being performed quickly without this, than by waiting any length of time for X-ray localization to be done. (Craig did not mention the length of time he would wait for X-rays.)

E. Treacher Collins (London), who did not always wait for localization, mentioned the important point that a very small opaque foreign body might fail to be visible to X-rays. The smallest body he had seen recognised by X-rays was slightly under 1 mm. in diameter, but he thought small metallic particles of less size might be implanted and escape detection.

Gray Clegg spoke in a similar sense to Collins. While a radiogram with correct localization would help considerably, he had found, in several instances, that the radiogram was negative, even when, by other means, the presence of a foreign body was definitely determined.

Finzi (London) entered at some length into the details of Mackenzie Davidson localization. The localization of a body in three planes is a very difficult matter. Whatever method of localization is used, it is advisable to make a preliminary radiograph of the head in the anterior and in the lateral positions, and this applies particularly to war wounds where there may be more than one foreign body. If the shadow can be observed on the screen, it is advisable to see if it moves with the eye, but it must be noted that if it is in the optic nerve it will move with the eye, and if in certain other parts of the orbit it will move, but not to the same extent as the eye. The higher the atomic weight of the substance the easier will it be to detect. Glass can be seen even in very small fragments if it is lead glass. Large fragments of soda glass can, small fragments cannot, be seen. Gravel may or may not be detected, as it stands pretty much on a level with soda glass, but is rather more easily seen. Bits of wood cannot be detected.

III.—The Magnet. IV.—The Route Selected.

Whitehead, in introducing the discussion, definitely brought up the question of the kind of magnet, i.e., giant or hand magnet. Personally, Whitehead uses a very powerful giant magnet. It is so arranged that it can be brought to the patient at different angles. In order to avoid involuntary movements of the patient he frequently employs a general anæsthetic. (The question of general anæsthesia seems hardly to have been touched on in the course of the discussion.—E.T.). This magnet was controlled by the operator through a foot switch, and Whitehead prefers this control. (This is very much insisted on by Haab.—E.T.).

As to the very debateable point of the route to be selected, the author's statement may be quoted: "If the steel is in the vitreous, in most cases I prefer to make a conjunctival flap, puncture the sclerotic behind the ciliary region by a Graefe's knife, and insert the point of the giant magnet, keeping the current on as it is withdrawn. In this way I am satisfied that better results are obtained."

Hill Griffith (Manchester) also employed the giant magnet, but, in opposition to Whitehead, he thought that when using this magnet one should always bring the steel fragment through the circumlental space, and so avoid damage. Since using a giant magnet he had never made a scleral incision if he could avoid doing so, as there was danger of detachment of the retina.

Craig was in the habit of employing both magnets, namely, the smaller Sweet magnet and the Haab magnet. A beginning was usually made with the smaller magnet, and always when the foreign body was visible. In the first place, one could better control the direction of the pull: and, in the second place, the feebler and slower action of the smaller magnet secured a better

orientation of the fragment. It was then inclined to come to the wound end-on instead of broadside-on as it would with a bigger magnet. Sometimes he alternated the two magnets. Craig regarded the intra-ocular introduction of the point of the magnet as a last resort, although he could not say that he had seen any untoward consequences attributable to that method.

E. Treacher Collins favoured the introduction of the small magnet point though an incision in the sclerotic, whenever he was able to obtain exact localization by the Mackenzie Davidson method. Under such circumstances of localization the method was attended by excellent results. But he did not always wait for localization, and in these circumstances drew the foreign body into the anterior chamber with the giant magnet. Collins is then reported to have said: "When the foreign body had been drawn into the anterior chamber there was a practical point connected with its removal to which he wished to call attention. A foreign body in the anterior chamber generally dropped to the lower part, and lay in the angle underneath the overhanging corneo-scleral margin. If an incision was made opposite the position of the foreign body it often caught under this overhanging sclero-corneal edge, and in attempting to remove it the iris prolapsed and had to be cut off. It was better, he thought, to make an incision with a keratome through the cornea on the opposite side to the foreign body, and introduce through the wound a spud which had been touched with a Haab's magnet, so as to magnetize it, then to draw the foreign body across the anterior chamber. In this way a foreign body could generally be removed without the occurrence of prolapse of the iris."

Gray Clegg used both types of magnet according to circumstances, the hand magnet when the foreign body was in, or had been brought into, the anterior chamber with the giant magnet. Small bodies in the vitreous were capable of passing round the periphery of the lens, and through the suspensory ligament into the posterior chamber, and even actually into the anterior chamber, although they often got entangled in the iris. In a proportion of cases Clegg made his section above and passed in the bent or curved armature of the hand magnet. Sometimes a body could be freed below, but got entangled in iris tissue above, so that an iridectomy had to be done. If the foreign body catches under the posterior lip of the incision either the hand magnet or the giant can be used to draw it on to the free surface of the iris. For a deeply-seated body it is sometimes best to enlarge the original wound. Large wounds of the sclera may be sutured with the finest silk and do well, even though the silk is left embedded beneath conjunctiva. The conjunctiva should be sutured over the scleral opening. Clegg emphasized the necessity of freeing an incarcerated iris from the corneal wound. In making a peripheral section for

the removal of a foreign body Clegg preferred the use of Graefe's knife to that of the keratome because the latter made a smaller internal section.

Clegg's views on the subject of removal through a surgical scleral incision seem to be, at least to some extent, in opposition to those of Collins and others (q.v.) These views are so strongly expressed that only an actual quotation will suffice. "Formerly, that is, fifteen or twenty years ago, it was the rule to make a radial incision in the sclera far back, introduce the hand magnet, and if the foreign body came away, well; but if not, removal of the globe or its contents was resorted to . . . But nowadays I consider such a procedure absolutely bad surgery; for the view that the persistent presence of a foreign body was a certain means of starting sympathetic disease in the other eye has been exploded, and the method adopted was too drastic to take, for in most cases complications arose, such as loss of vitreous, and later separation of the retina from shrinkage of the scar tissue, chronic or acute uveitis, and the eye was lost, not so much from the accident as from the operative treatment. My own practice is to leave such cases (i.e., where the foreign body does not come away by Clegg's usual procedure,—E.T.) alone, and merely watch events. Even if marked siderosis is present, in my opinion, sympathetic disease is not likely to be set up unless the injured eye becomes inflamed and tender and the tension becomes minus." It is difficult to state that Clegg is referring to precisely the same cases as Collins and others, because Collins refers to localized bodies and Clegg to those in which localization has failed, but, at any rate, there seems to be marked divergence of view regarding removal by scleral incision, and the originals may be referred to by those particularly interested in the subject.

Lastly, reference has been made in parenthesis to Clegg's usual method where a foreign body is not brought forward on the day of the accident by the giant magnet. This method is to repeat the application of the magnet several times at intervals of a day or so.

Stephen Mayou (London) employs a combination of the magnet with the telephone probe The telephone probe is tapped into the end of the magnet near the point before the latter is introduced into the eye. With this device one can hear the smallest foreign body hit the magnet when it comes into contact with it in the eye. The magnet should be inserted with current turned off, and when it is switched on, the foreign body can be heard making contact with the magnet.

Cridland said that he was not possessed, in the meantime, of a very powerful magnet. He used the Hirschberg magnet. With the exception of cases in which the body lay in the anterior chamber and iris, he favoured the introduction of the point within the globe, either through the original wound, enlarged if necessary, or through an opening in the sclera, avoiding the ciliary region, and in the

closest proximity to the foreign body or its suspected position. He did not hesitate to introduce the point freely into the vitreous, even several times if necessary. He could point to successful results even after having introduced the point six or seven times into the vitreous.

George Mackay preferred the giant magnet provided it is not of the fixed type. For small particles he employed the circumlental route, but for large fragments in the vitreous he made a scleral incision. Mackay insisted on the advisability of making a large enough incision. If the foreign body came broadside on, the lips of the wound might require to be separated.

Rowan preferred the hand magnet where possible, as the movements of the foreign body caused by the large magnet often seriously injured the eye.

Whitehead, in his reply, considered that with a very powerful magnet withdrawal by a posterior incision disturbed the vitreous least. His magnet was 50 per cent. stronger than any Haab magnet which had been made before.

Summary.—The reviewer concludes that in this discussion Clegg is the principal opponent of the scleral route where the sclera has not already been opened by the foreign body, but that most other surgeons who took part in the discussion are content to get at the foreign body in this manner if necessary, or even by preference.

V.—Siderosis.

Whitehead.—"A piece of steel or iron if left in the eye will sooner or later set up the pigmentary, inflammatory, and degenerative changes known as siderosis bulbi."

Parsons, after referring to the well-known appearances of siderosis, both gross and microscopic, said that the chemistry of this condition is not yet fully understood. E. von Hippel says that the iron is dissolved by the carbon dioxide of the tissues and is fixed by cells which have a specific affinity for the metal; it then becomes oxidized. It has also been suggested that the iron is dissolved by acid phosphates in the intra-ocular fluid, or that iron may enter into solution in organic form as an albuminate or in combination with an organic acid. The brown precipitation in the tissues is almost certainly produced by oxidation, but it is not a simple oxide or hydroxide, as it is only very slightly soluble in oxalic acid (McMullen). The characteristic ring of brown spots under the lens capsule is caused by deposition of iron in circumscribed aggregations of newly proliferated capsular epithelium. Leber showed experimentally that the introduction of a particle of iron into the vitreous causes extreme degeneration of the retina. Peculiar large granular cells are found which are derived for the most part from the retinal pigment epithelium.

E. Treacher Collins mentioned a case which seemed to show that siderosis might disappear if the foreign body were removed. The steel had been in the eye four months before it was removed, and had caused siderosis. Two years later all discolouration of the iris had passed away.

Clegg had not much to say on this subject, but referred to his article "Siderosis" in the *Ophthalmoscope* for 1915. He implied, however, that if the iron body is removed after siderosis has taken place, the latter may disappear and the eye do well. Typical siderosis may be preceded by inflammatory changes in the choroid.

VI.—Sympathetic Ophthalmia.

Whitehead.—"The onset of sympathetic irido-cyclitis secondary to the retention of a foreign body in the exciting eye is not common in the experience of my hospital."

Parsons.—The remarks of this speaker may be summarized as follows.—The theory which best accounts for sympathetic ophthalmia is the metastatic theory, the transmission of a specific organism, as yet unidentified, by the blood-stream. The site and nature of the wound are potent factors and not the mere retention of a foreign body. A sterile foreign body does not itself cause sympathetic, but secondary infection may do so. Any wound involving incarceration of ciliary body or iris or capsule is dangerous because (1) it keeps the uveal tract in a state of constant irritation and hyperæmia, and (2) healing of the wound is impaired with consequent liability to secondary infection. The site and nature of the wound are universally recognized factors in so far as they facilitate access of the *materies morbi* (whatever it may prove to be) to the blood-stream. "The question of treatment, and therewith of prognosis therefore depends upon the methods of dealing with the irido-cyclitis. If the incarcerated structures can be effectually liberated there is a good chance of the eye becoming quiet, in which case danger is usually at an end. Often, however, this problem presents insuperable difficulties, particularly in the case of wounds involving the lens in children, who are themselves, in my opinion, specially prone to sympathetic ophthalmia. I do not think that the mere retention of a sterile foreign body, whatever its nature, is of any importance at all so far as sympathetic ophthalmia is concerned."

Parsons stated that, according to Leber, sympathetic disease is less likely to follow copper foreign bodies than others owing to the intense reaction. Lead becomes coated with carbonate and in 22 cases collected by Tornatola sympathetic was never caused. Doyne regarded fragments of china as specially conducive to sympathetic.

Hill Griffith agreed with Parsons that the mere presence of a

foreign body was not a cause of sympathetic ophthalmia. He had himself arrived at the same conclusion.

Craig remarked that some means was wanted whereby one could know when sympathetic was likely to occur. A great many eyes, which were now sacrificed on account of the risk of sympathetic, would be saved, and a great advance be made.

E. Treacher Collins had been educated to believe that if he could not get a foreign body out of an eye, the eye should be excised. Experience had taught him otherwise; if an aseptic foreign body became implanted in an eye and was chemically inert, it caused no disturbance apart from the wound of entry. When sympathetic trouble arose it was connected with the nature or infection of the wound.

Clegg stated that sympathetic did not occur among his (130) cases. Nor did he consider sympathetic likely unless an eye became inflamed and tender and the tension minus.

Arnold Lawson practically replied to the desire expressed by Craig for "some means of estimating what were the chances of the supervention of sympathetic trouble," in an important series of paragraphs which seem to demand textual quotation:

"We are in a much better position to judge of the danger than we were some years ago, and there are at least four great warning signs which will notify the surgeon that he is taking undue risks.

(1) Protracted and intractable cyclitis or general uveitis which goes on for week after week in spite of treatment.

(2) The gradual supervention of an increasing lowering of the intra-ocular tension which is always accompanied by progressive failure of sight.

(3) Continual photophobia and sympathetic neuroses affecting the other eye.

(4) The condition of the blood count."

"Perhaps the most important of these signs is the increasing lowering of the intra-ocular tension. It is the most unfavourable sign we can have as regards the vision, and when once the eye, after penetrating injury with a foreign body, has become markedly minus in tension, and there is a good seeing eye on the other side, there can be no doubt, I think, that the most prudent course is to remove it" . . . "The time when an eye becomes so dangerous as to warrant its removal is an indeterminate one, and every case must be judged on its own merits. It is in such cases that the blood-count, as initiated by Mr. S. H. Browning, proves of enormous value. The advent of a large or considerable increase in large mononuclear cells must, I think, be held to show that the safety limit has been passed, and therefore in every case of difficulty a close watch should be kept on the blood-count, and the eye removed at once if significant alterations present themselves."

Hern believed that there were two kinds of sympathetic trouble met with in practice. One was septic, and the other was some peculiar non-toleration of the eye to the presence of a foreign body.

Ormond (London) said that until recently he was able to say that he had not seen a case of sympathetic ophthalmia arising out of the war, but he had recently had one.

Whitehead, in his reply, said that the remark of Collins that the presence of a foreign body was of practically no account, and that the wound of entrance was the point of danger, was a strong argument in favour of removal by posterior incision. If the surgeon increased the danger by making another wound in front, there was a greater risk of sympathetic ophthalmia by the production of partial incarceration of the iris. A small linear incision, after turning back a conjunctival flap behind the ciliary processes, caused no inconvenience. He had had frequent opportunities of inspecting with the ophthalmoscope the scar he had made, and it caused no subsequent interference with vision.

VII.—Peculiarities of Military Cases

Whitehead voiced what turned out to be the opinion of others, that military cases were disappointing. In a large proportion of penetrating injuries the eye had been excised in France with removal of the foreign body at the same time. In some of these cases a persistent sinus existed, fragments of shell being left in the orbit. Such foreign bodies in the eye were rarely magnetic, e.g., copper or brass, and set up conditions calling for enucleation. Minute fragments of sand or stone set up traumatic cataract, but the removal of such a cataract was not followed by improvement in vision, since the vitreous was usually more or less opaque and the retina often detached. Operative interference was apt to light up a chronic irido-cyclitis and the eyeball had to be enucleated. When the orbit was penetrated, but not the eyeball, vision might be unimpaired, but more usually there was an intra-ocular hæmorrhage or rupture of the choroid or detachment of the retina.

Hill Griffith agreed with Whitehead that in military cases the proportion of success is not nearly so high as in civil cases. Manganese steel is not magnetic.

E. Treacher Collins had seen three cases of war injury in which there was only one wound of entrance but several foreign bodies in the eye, as shown by radiography. He believed these bodies were pieces of lead which broke up in the eye.

Ormond said that military cases were usually only seen in English base hospitals after about fourteen days. By the time localization had been obtained generally another week had elapsed, so that at the end of three weeks the surgeon was face to face with a man who had, in one or both eyes, one or several foreign bodies.

Under such circumstances, the eyes being quiet and the vision fair, should an attempt at removal of the foreign bodies be made or not? Ormond's practice up to the present had been that if there were no inflammatory signs in the eye, and if there was reading vision or even 6/24, he left the eye alone. He was much influenced by several cases in which the foreign body had been removed in France and the patient sent home afterwards. In these the eye was useless for visual purposes. That being so he was not inclined to allow a man to risk losing the sight he might possess. Probably ophthalmic surgeons in England did not see the good results.

Ernest Clarke (London) said that his experience during the war had been that small foreign metallic bodies entering the eye did much less harm than was expected, either at the time or later. One explanation appeared to be that they are strictly aseptic, rendered so by the high temperature, in some cases from the explosive bomb they had left, and, in the case of bullets by the bullet striking some hard substance before being shattered.

VIII.—Effect of the Workmen's Compensation Act

R. J. Hamilton (Liverpool) spoke of the moral point of view. Since the passing of this Act, men had been coming to the hospital with eye injuries and staying eighteen months, receiving all the time club money and perhaps half wages. The men would probably become "slackers." Would not such men (i.e., where the injured eye has been saved, but is of little practical use) have been better workmen if their one eye injured had been removed straight away?

Mackay, as an ophthalmic medical referee under the Act, said he had had considerable experience of the neurasthenic cases referred to by Hamilton. If he was satisfied that, to the best of his judgment, the injury was healed, he advised, with some firmness, a return to work, and such a reduction of compensation as would encourage the workman to do his best to earn something for himself.

ERNEST THOMSON.

II.—PRIMARY PROGRESSIVE CALCAREOUS DEGENERATION OF THE CORNEA

Axenfeld, Th. (Freiburg i. Br.).—**Bilateral primary progressive calcareous degeneration of the cornea.** (**Ueber doppelseitige primäre progressive parenchymatöse Verkalkung [Dystrophia calcarea] der Cornea.**) *Klin. Monatsbl. f. Augenheilk*, January, 1917.

Axenfeld describes a case of primary calcareous deposit in both corneæ of a man of 34, which had gradually increased from the

appearance of a small bright spot in the right eye in the sixth year to a complete ring. At intervals of a few weeks the eyes became red, but there was no marked inflammation. His general health was and always had been good. When seen by Axenfeld the conjunctivæ of both eyes were moderately inflamed. Both corneæ showed a normal area roughly corresponding to the size of the pupil, which area was surrounded by a white calcareous glittering ring reaching on the temporal and nasal sides close to the limbus, but separated from it by a narrow transparent band. Above and below, the limits of the deposit were not so sharply defined, and it did not extend so near the limbus. Towards the centre of the cornea the edge was less sharply defined. The surface was quite smooth and the epithelium was intact. On close examination with the lens the central area showed fine lattice-like opacities deep in the substance. The condition was rather more advanced in the right eye. Vision right, with correction, 6/12; left, with correction, 6/8. Two small peripheral pieces were removed for examination from the right cornea. Treatment, which was without result, consisted in the use of baths of hot 5 per cent. solution of ammonium tartrate, as suggested by zur Nedden.

Microscopical examination showed numerous small highly refractile particles without definite shape, soluble in sulphuric acid, from which solution typical calcareous crystals could be obtained. The epithelium was practically unaltered except where the calcareous deposit had reached it and caused some irregularity and thinning of its layers. This was only the case near the limbus where Bowman's membrane had been destroyed. In contrast to the appearances met with in band keratitis the deposit of calcareous material was chiefly in the parenchyma of the cornea and there was no microscopical evidence of any antecedent inflammation. Microchemical reaction with acids showed no effervescence and, therefore, the deposit seems to have been phosphate and not carbonate of calcium.

Axenfeld groups the progressive degenerations of the cornea into four :—

(1) The chronic degenerations of a hyaline type (clump-shaped, Groenouw; lattice-like, Haab, Dimmer; familial, Fleischer).

(2) Progressive degeneration from deposit of uric acid salts (Uhthoff).

(3) Progressive fatty degeneration (Tertsch).

(4) The degeneration described in this paper as progressive interstitial calcareous deposition (Axenfeld).

E. E. H.

CORRESPONDENCE.

The Editor THE BRITISH JOURNAL OF OPHTHALMOLOGY.

SIR,—Mr. Zorab has called my attention to a regrettable error in the last English edition of Fuchs's "Ophthalmology." On page 986 are the words: "This operation, originally performed by Zorab, and revived by Wood, is designed mainly for employment in absolute glaucoma."

This gives the impression that the operation of seton drainage or aqueoplasty, devised by Mr. Zorab, had fallen into desuetude. This is not the case. Mr. Zorab has performed it systematically ever since he first suggested it, and that, too, not only for absolute glaucoma, but for glaucoma in all stages.

I shall be glad if, in justice to Mr. Zorab, you will make this correction.

Sincerely yours,
ALEXANDER DUANE.

139 East 37th Street
New York.
August 18, 1917.

BOOK NOTICES

Congenital Word-Blindness. By JAMES HINSHELWOOD, M.A., M.D., etc. London: H. K. Lewis & Co., 136, Gower Street, W.C. 1917. 4s. net.

This book comprises in handy and useful form almost everything that can be said in regard to congenital word-blindness up to the present date. The author was one of the first to draw attention to this important defect, and he more than any other has contributed to our knowledge of this subject. It is to be hoped that this book may be the means by which educationalists will gain a better knowledge of a subject to which their attention needs to be drawn, while it cannot fail to be attractive to neurologists and to ophthalmic surgeons.

The author recognizes the various degrees of congenital word-blindness which are met with clinically, and thinks that in the vast majority of cases the lesion resides in the left angular and supra-marginal gyri, regarding it as a developmental defect of the cortex in this situation. While agreeing with him as to the seat of the disorder, we are not much convinced by the chief argument which he adduces in its favour, viz.: that right hemianopia is not present

in the congenital, while it is almost universal in the acquired cases of word-blindness.

Hinshelwood recognizes, but does not emphasize as much as we could have wished, a differentiation of the congenital cases into hereditary and birth injury cases. He recognizes that a great preponderance of the cases occurs in boys, and states that there is no explanation of this inequality in the sex incidence.

We are of opinion that if the reported cases of congenital word-blindness had been more fully recorded, they could be differentiated into two classes: (*a*) those with a familial tendency; (*b*) those without a familial tendency; and it would probably be found that in class (*a*) sex inequality was by no means a marked feature, while it would be in class (*b*) that the preponderance in male subjects would be recognizable. The reviewer thinks that the bulk of the cases in class (*b*) are due to birth injury, and that owing to the larger size of the head in the male child at birth, the male subject is especially liable to birth injuries of the cerebral cortex. This has been proved in regard to birth palsies, and it probably only needs more careful investigation to prove the same point in regard to the cases of congenital word-blindness that would fall into class (*b*).

Hinshelwood has much that is useful to say as regards the methods of teaching these children to read. He deprecates the "look and say" method, and advocates the education of the vicarious right angular gyrus by the ordinary methods which are employed in teaching every normal child to read. It seems, however, that he has not paid very much attention to the "look and say" method, and that there is perhaps more to be said in its favour than he recognizes. It must be used on an intelligent plan and with diligence. Miss Mason's reading box method is probably the best available, and has been rapidly and entirely successful in several cases in which it has been used at the suggestion of the reviewer. Hinshelwood recognizes that instruction in learning to read produces rapid cerebral exhaustion, and that frequent intervals must be allowed in the lessons, which need personal supervision and perseverance, whatever method be employed. In cases of acquired word-blindness where the left angular gyrus is irrecoverably destroyed or its association fibres with primary visual centres are hopelessly cut off, patients can again teach themselves to read, and the presumption is that the right angular gyrus substitutes for its fellow.

We see no particular reason why there should be more rapid exhaustion of the right angular cortex than of the left by the processes necessary to its education. It is conceivable that in some of the birth injury cases of congenital word-blindness, the left angular gyrus, though impaired, is not incapable of being educated

in the visual memory of letters and words if sufficient time and care are given to the process; such a wounded, but not killed, area of grey matter would presumably be more liable to exhaustion than healthy cortical material.

J. HERBERT FISHER.

The Ophthalmic Year Book. Vol. XIII, containing a digest of the literature of Ophthalmology for the year 1916. Edited by EDWARD JACKSON, M.D. Published with assistance of the Knapp Testimonial Fund of the Section on Ophthalmology of the American Medical Association. Herrick Book and Stationery Company, Denver, Colorado, 1917.

This invaluable work of reference on ophthalmology has again made its appearance, and, as the preface tells us, does not differ much in size, or in the nature of its contents, from several of its predecessors. Since Nagel's *Jahresbericht* and the *Revue générale d'Ophtalmologie* have ceased publication, this is the only work that attempts to sum up the ophthalmic literature of 1916. It is stated that a movement for the union of American ophthalmic publications, similar to that which has recently taken place in this country and in Italy, is now well advanced, and that the *American Year Book* will take part in this, so that the present volume probably completes a series. But there is every reason to believe that the new form will give its readers something still more serviceable than the *Year Book* has been in the past. If this promise is kept, we should have a work of such value that we should hope to see a rather more extensive list of English ophthalmologists on the subscription page.

There are not so many illustrations as in some previous numbers, but an excellent coloured plate of two stages of tuberculosis of retinal vessels forms the frontispiece.

It is hardly possible to review a book which is itself a collection of reviews, and we can only congratulate the authors of the various sections on the care with which they have done their rather thankless task.

E. E. H.

The Medical Annual, 1917. Bristol: John Wright & Sons, Ltd. Price 10s. net.

Dr. A. Hugh Thompson has written the section dealing with diseases of the eye in the *Medical Annual* for 1917. He first takes up the general therapeutics of eye disease, describing in turn the desiccation method of dealing with certain new growths advocated by William L. Clark, of Philadelphia, the uses of methylene blue and of silver salts in conjunctivitis and of thyroid gland in certain diseases of

the eye, and Harman's observations as to an economical solution for the keeping of alkaloids commonly employed in eye work. His other article ("War Injuries to Eye") deals in the first place with the improvement that may be sometimes effected in a patient's appearance by plastic surgery supplemented by mechanical devices. Injuries to the eye are classed and discussed under four heads: 1. direct injuries to the globe; 2. indirect injuries from the passage of a projectile near the globe; 3. functional effects; and 4. hemianopia due to wounds of the occiput. The value of the descriptions is enhanced by reproduction of the figures which accompanied the original articles. S. S.

Annual Report and Statistics of the Government Ophthalmic Hospital, Madras, for the year 1916. Madras: Printed by the Superintendent, Government Press. 1917. Price, 2s. 3d.

The 1916 report of the Government Ophthalmic Hospital at Madras by the superintendent, Major H. Kirkpatrick, I.M.S., includes details dealing with the buildings, the training of students and practitioners, finance, and so forth, into which we need scarcely enter here, beyond perhaps stating that the number of beds in the Hospital for Europeans and Eurasians is 24 and for Indians 136, and that this accommodation is eked out, when necessary (which seems to be often the case), by placing beds on verandahs.

A few details dealing with the surgical work of the Hospital are likely to prove more acceptable to our readers.

The number of in-patients in the year under review, was 2,876, and of out-patients, 17,017, Of the in-patients, no fewer than 1,499 were admitted for diseases of the lens and its capsule. The operations for senile cataract numbered 1,252.

Of 935 patients operated upon by one surgeon, expression in the capsule was carried out in 45, and extraction with laceration of the capsule in 890. The last-named operation, however, was adopted as the routine procedure after January, 1916, which may or may not have been connected with the fact that "failure" (V.=less than ability to count fingers at 2 m.) followed in 11·1 per cent. of the expressions, and in 4·8 per cent. of the other operation. After expression the invariable cause of failure was vitreous impaction. It may be noted, too, that vitreous was lost in 4·4 per cent. of the intra-capsular extractions, and in 2·14 per cent. of the other operation.

Subconjunctival injections of saline were very freely administered during the after-treatment of cataract extractions. If there were cortical remains or any trace of iritis, they were given from the fifth day. The opinion is expressed that they appear to limit cell

deposit on capsular remnants, and to aid materially in the absorption of cortex. On the day following operation, aluminium shields, one for each eye, are substituted for the dressing. The shield belonging to the eye which had been operated upon, is furnished with a window of amber glass, the other being merely a skeleton, as it were, intended mainly to keep the first shield in position. Patients are not confined to bed after the second day.

Of the 133 eyes trephined during the year, 17 were blind and painful from glaucoma, and the operation was successful in lowering tension and relieving pain in 14 of these cases.

Details are also included of 22 eyes which had been trephined for upwards of two years. Two eyes in a patient operated upon six years before, had excellent vision after removal of the cataractous lenses. Of four eyes, operated upon five years previously, one showed marked improvement, two were blind prior to operation and remained so, but with low tension, and one obtained fair sight after the lens had been extracted. Of six eyes of four years' duration, three had failed from irido-cyclitis, one had excellent vision, one obtained good sight after extraction of a cataractous lens, and one remained blind. Among nine of three years duration, vision failed to improve, but tension remained low, in two the glaucoma was cured, but the eyes were blind from diabetic retinitis, two were very much improved, and in one good sight was obtained after removal of a cataract. Finally, in one eye examined two years after trephining, the operation had failed from chronic iritis.

It is of interest to note that 12 eyes were trephined for retinitis pigmentosa, and that the results, upon the whole, were encouraging. For instance, five of the eyes were improved, three being markedly so. Seven eyes were unaltered, but four of these were blind before operation.

S. S.

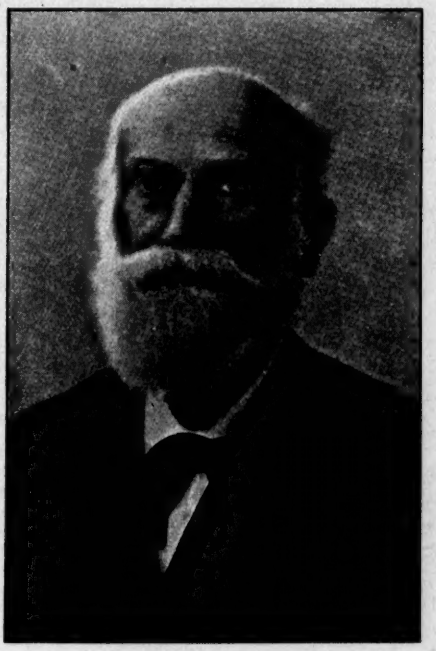
OBITUARY

THEODOR LEBER
(1840-1917)

The unexpected death of Theodor Leber, formerly professor of ophthalmology in the University of Heidelberg, is announced. The loss of this most distinguished scientist will be widely and deeply deplored.

Leber was born on February 29, 1840, at Carlsruhe, and died on April 7, 1917, at Heidelberg.

In 1865 Leber published his first important work dealing with the blood-vessels of the human eye, the material for which he had gathered in the laboratory of Karl Ludwig in Vienna. For some years he was assistant to R. Liebreich, in Paris. By a somewhat curious coincidence the last work from Leber's pen was an account of the life and work of Liebreich, which was published in the same number of the *Klinische Monatsblätter für Augenheilkunde* that contained his own obituary notice.



Leber worked with Albrecht v. Graefe for nearly four years, and in a very real sense may be said to have continued the life-work of his master. Much of his work dealt with physiological and pathological problems. In Britain he was perhaps best known as an authority upon inflammation of the eye, a subject he took for his address when he delivered the Bowman Lecture of the Ophthalmological Society of the United Kingdom, on June 10, 1892. That address ("On the present position of our knowledge of inflammation with especial reference to inflammation of the eye") was of a comprehensive and most scientific nature. It took up the

subject of inflammation generally, and set forth clearly the influence of micro-organisms and their products in the process. It brought into prominence the fact that certain pure chemical substances had capabilities of calling forth purulent inflammation similar to that due to the products of micro-organisms. It was shown that in the eye some chemicals, as mercury and copper, had the power of inducing aseptic inflammation. It insisted upon the essential difference between this kind of suppuration and that set up by micro-organisms, namely, that suppuration in the former had not the same power of extension as in the latter. In other words, "the inflammation caused in the eye by chemical agents remains more or less limited to the affected area."

Leber's activities, however, were by no means confined to subjects of pathological importance. He was an inspiring teacher and a most acute clinical observer. His name is well-known in connection with leucæmic retinitis, the ocular complications of diabetes mellitus, conjunctivitis petrificans, and especially with hereditary neuritis and atrophy ("Leber's disease"). Abundant evidences of his clinical acumen are to be found in Leber's contributions to the Graefe-Saemisch *Handbuch*, the Heidelberg Ophthalmological Society, and to the *Archiv für Ophthalmologie*, of which he was one of the editors. In 1896 he was presented by the Ophthalmological Society of Heidelberg with the Graefe Prize in recognition of the value of the work he had accomplished in ophthalmology.

A list of Leber's scientific contributions, which number upwards of one hundred, may be found in *Klinische Monatsblätter für Augenheilkunde*, Bd. LVIII (1917). A sympathetic account of his life and work by A. Wagenmann was published in the *Archiv für Ophthalmologie* of June 25, 1917.

For the following we are indebted to Mr. Priestley Smith :—

Through the death of Theodor Leber we lose a scientific leader to whose work during the last fifty years modern ophthalmology is heavily indebted.

Born in 1840, he became in due time a student at the University of Heidelberg, and thereupon elected to devote himself to natural science. Botany was at first his chief interest, but offered no substantial prospects. Chemistry he was advised against, and so he turned to medicine. He was fortunate in his opportunities. Helmholtz, then Professor of Physiology at Heidelberg, was one of his teachers ; Hermann Knapp introduced him to ophthalmology ; his examinations over he studied under Ludwig in Vienna, and under Virchow in Berlin. By the time he was 24 years of age he had done original work of lasting value. In 1865 a communication to the Heidelberg Ophthalmological Society on the blood-vessels of

the eye attracted general attention and brought him an invitation from R. Liebreich to come to Paris as his assistant ; he held that post for several years. An assistantship under Helmholtz he declined, having gone so far in ophthalmology, and when, on leaving Paris, he went to Berlin as assistant to von Graefe, the influence of that inspiring teacher confirmed his devotion to ophthalmology, then rapidly developing on scientific lines. From 1871 onwards, as a Professor, and a Director of a University Eye Clinic—in Göttingen for nearly 20 years and thereafter in his own University of Heidelberg—he had those enviable opportunities of combining clinical work with original research which he desired. In 1910 he resigned his position as a teacher to devote himself entirely to scientific work. Though latterly in failing health he was clear and keen to the last. Only 14 days before his death he completed a long obituary notice of his one-time teacher, Liebreich. His death came suddenly and unexpectedly through a heart attack in April of the present year.

His life and labours have been described by two of those who were for a long time his assistants in the Heidelberg Clinic (see von Graefe's *Archiv* and *Klin. Monatsbl. f. Augenheilk.*). The present writer knew him through meeting him many times in professional and social gatherings, and through visiting his Clinic and enjoying the hospitality of his home in Heidelberg.

The quality of Leber's work reveals the nature of the man. A large part of what we know of the circulation, nutrition-processes and changes of fluid in the eye we owe to him. To this subject he returned again and again, testing and retesting his own conclusions, devising new methods of experiment, and carefully considering the work of others. His first comprehensive work dealing with the whole matter appeared in the Graefe-Saemisch *Handbuch* in 1876. Elaborated in many directions it reappeared in the second edition of the same work in 1903. Only three years later he had re-investigated a number of subordinate points on which doubts had been suggested (see his " Fresh Experiments on the Change of Fluid in the Eye," von Graefe's *Archiv*, Vol. 64, Part I). He took immense pains to arrive at correct results. He had no exceptional eloquence as a speaker or facility as a writer, but when himself convinced he stated his results with confidence devoid of self-assertion. Leber's conclusions in this field of work are not universally accepted, and of course they are not final, but those who dispute them will be wise to elaborate their researches with equal care.

Though devoted to ophthalmology, Leber's outlook was not that of a specialist. He used the eye as a field for the study of physical and pathological processes of a general nature. In his classical work on the Causes of Inflammation (see abstract in *Ophthalmic Review*

of 1891 and 1892, and Bowman Lecture of 1892) he confirmed Cohnheim's doctrine of pus-formation by migration of white blood corpuscles, demonstrated chemotaxis, and explained the occurrence and importance of toxins. His work in this field has largely influenced practice.

In view of its quality, the amount of original work he did is truly astonishing. The titles of his papers would fill half a dozen of these pages. Yet he was an energetic clinician, keen as to detail in every case, transferring his responsibility unwillingly to others, and of untiring patience. The explanation is that his work was the one absorbing interest of his life. The care of his garden appears to have been his chief recreation and even on his holidays he spent the half of each day among his papers and books. Since the death of their founder, Leber edited von Graefe's *Archiv*. The re-writing of the chapter on Diseases of the Retina for the second edition of the Graefe-Saemisch *Handbuch* was begun after his seventieth birthday, and after nearly six years of work, he had the satisfaction of seeing it completed.

What Leber did for ophthalmology lies not only in his published work. His example influenced a large number of pupils and assistants. He was no stern task-master; his rebuke for careless work was to take it upon himself and to do it thoroughly. He encouraged those who worked with him, and rejoiced in their success. He had no children but was happy in the help and sympathy of a devoted wife.

The events of the last three years have placed a bar between our race and his, but they have not diminished our indebtedness to him. It is at once a duty and a grateful task to pay a tribute to his memory in these pages.

The deaths of the following ophthalmic surgeons are announced from the United States:

W. J. Neill, Chicago, 66 years; O. W. A. Schirmer, New York, 52 years; C. G. Reilly, Los Angeles, 58 years; A. C. Posey, Hanford, Cal., 68 years; E. M. McCabe, New Haven, Conn., 53 years; and S. R. Robinson, Sturgis, Mich., 65 years.

Pedro Lagleyze, who died on August 1, 1916, was of French extraction, and was born in Buenos Ayres in 1855. He studied medicine in his native place and graduated in 1882. From 1889-1916 he was professor of opthhalmology and chief of the ophthalmological clinic in Buenos Ayres, having served for five years previously to 1889 as assistant professor to Aguine. Lagleyze took part in many congresses; amongst others he represented Buenos Ayres in medicine at Washington in 1893, and he represented the

Argentine University at the second congress in 1904. He was present at the Congress in Monte Video in 1907, and at that held in Naples in 1909. He was founder and first president of the Society of Ophthalmology of Buenos Ayres, and a corresponding member of various foreign ophthalmological societies; in 1911 the high honour was accorded him of being elected president of the Academy of Medicine in his native city. His writings were numerous and covered a large field. He has been succeeded by Demaria.

Professor Boleslaus Wicherkiewicz, director of the University Eye Clinic in Cracow, died in Vienna, aged 67 years, on January 7, 1916. The son of a medical man, he was born at Kcynia (Exin) on July 7, 1847. He studied in Berlin. Wicherkiewicz served as assistant surgeon in the Franco-Prussian War, and on the conclusion of peace returned to Berlin and took his medical degree. He soon decided to devote himself to ophthalmology, and first settled in Breslau. He studied in London under Critchett, senior, Couper, Bowman, and others, and after that worked in Paris with Panas, Wecker, and Sichel. He then opened a private clinic in Posen. In 1895 he was transferred to Cracow. He founded the *Postęp Okulistyczny*, belonged to numerous ophthalmological societies, and was the correspondent of many foreign eye journals.

We have also to announce the death of E. Pergens, who was born, practised, and died at the Belgian town of Maeseyck. He made many investigations dealing with optotypes, and wrote extensively on the historical aspects of general medicine and ophthalmology. He was a foundation member of the Oxford Ophthalmological Congress, and attended at least one meeting of that body. He possessed an important library of ophthalmological books.

Heinrich Schiess, of Basle, has died at Grebs, at the age of 81 years. He studied at the Universities of Basle and Würzburg. Inspired by A. von Graefe, he took up ophthalmology in 1861 at Basle, where in 1864 he founded the eye institute with the modest number of six beds. His last years were saddened with threatened blindness.

Dr. Guiata, director of the University Eye Clinic in Florence, and for many years editor of the *Annali di Ottalmologia*, is dead.

Friedrich Loeffler, the noted bacteriologist, has died at the age of 63 years.

Another famous bacteriologist, Paul Ehrlich, has died at a comparatively early age at Bad Homburg. His name is inseparably bound up with the discovery of salvarsan.

v. Prowaczek, who first described the inclusion bodies of trachoma, has succumbed from typhus at the age of 40 years.

The deaths of the following German and Austrian ophthalmologists are announced:

Professor Hermann Schmidt-Rimpler died, at the age of 77 years, in September, 1915. He had been closely associated with Albrecht von Graefe. To begin with, he was a military surgeon, but later became for a time *chef de clinique* to Graefe. He was attached to the Berlin Charité. Schmidt-Rimpler afterwards went to Marburg, and then to Göttingen and to Halle. He finally retired owing to the disabilities entailed by cataract. His published communications were both numerous and important. Their titles occupy some eight pages of the *Klinische Monatsblätter für Augenheilkunde* (January, 1916), in which a notice of him appears by Axenfeld.

Professor R. Ulrich, of Königsberg, aged 67 years, known for his researches on the exchange of the intra-ocular fluids.

Conrad Froelich succumbed to pneumonia, in Berlin, at the age of 67 years.

Adolf Nieden, of Bonn, at the age of 70 years. He was once assistant to Saemisch. In 1874 he settled in Bochum as an ophthalmic surgeon, and left for Bonn in 1902. His investigations upon miners' nystagmus are well known, as are also his several publications upon occupational diseases of the eye.

Professor Birnbacher, of Graz, at the age of 64 years. Specially noteworthy was his investigation of the vortex veins in glaucoma, published jointly with Czermak.

Professor Goldzieher died, at the age of 67 years, on June 15, 1916. He was born at Köpcsény (Hungary), studied in Vienna and Heidelberg, and acted as assistant to O. Becker in the last-named city. He took part in the campaign of 1870-71. He settled in Budapest in 1875. He wrote the first Hungarian text-book of ophthalmology (1890) and edited the *Szemészeti Lapok*. He was a gifted clinical observer, and was probably the first to describe the affections now commonly known as "Parinaud's conjunctivitis," "Retinitis circinata," and "v. Hippel's disease."

Emil Bock was born in 1857 in Galicia, and worked under v. Stellwag-Carion for several years. In 1889 he settled as an ophthalmic surgeon in Laibach, where he died recently. He was a prolific writer and deeply interested in music and the fine arts.

Arthur von Hippel, of Göttingen, died immediately after he had attained his seventy-fifth birthday. On the recommendation of Arlt, he became an eye surgeon, and in 1869, then being aged 38 years, he was called to Giessen, where he became director of the clinic. He succeeded Jacobson as professor of ophthalmology in Königsberg in 1890, but two years later he went to Halle as successor to Alfred Graefe. He was widely known for his work on corneal transplantation, for the performance of which he devised a clock-work trephine.

During the last ten years he devoted much attention to tuberculous affections of the eye, and the principles of treatment by tuberculin laid down by him have been widely adopted. The last few years of v. Hippel's life were clouded by trouble, both of a domestic and a personal nature. He was succeeded in the Göttingen chair by his son, E. v. Hippel, the present incumbent of the office.

Professor W. Schoen, of Leipzig, at the age of 69.

C. Hirsch, of Prague.

Dr. Krüger, of Frankfort.

Max Schur, who was born at Kitzingen, in 1885, and who died at Neu-Gaiseanka (Roumania) in 1916, had been for a long time assistant in the eye clinic of Tübingen.

Professor Treitel, of Königsberg, well-known for his researches into the light-sense.

F. Ritter v. Arlt, of Vienna, the son of a celebrated father, whose name is familiar to every ophthalmologist.

Adolf Weber, of Darmstadt, at the age of 86 years. The son of a medical man, he was born in Giessen. In 1848 he attended the local University, where he at first pursued the study of chemistry, but later took up medicine. Owing to the influence of v. Graefe, Weber decided to devote himself to ophthalmology. In 1855 he settled as an ophthalmic surgeon in Darmstadt, and in 1860 erected a private clinic. His name was closely associated with the treatment of lacrymal affections, of corneal ulcers, and of high myopia, while he did pioneer work as regards the ætiology of glaucoma.

Jacob Stilling, of Strassburg, at the age of 72 years. The son of a celebrated medical man, Benedikt Stilling, he was born at Cassel. He studied in the Universities of Göttingen, Marburg, Würzburg, and Berlin. Stilling wrote extensively upon colour-vision, myopia, and glaucoma. He took much interest in the therapeutic properties of the anilin dyes.

Clemens Harms, of Tübingen, was killed on July 23, 1915, on the Polish front. He was born in September, 1875, at Kloster Weinharsen, near Celle, Hanover, and worked for two years with Uhthoff, in Breslau. He settled at Tübingen in 1905, and shortly before the outbreak of war was appointed extraordinary professor.

NOTES

Appointments

Temporary Surgeon-General M. T. Yarr has been granted the K.C.M.G.

William T. Lister, C.M.G., has been appointed Hunterian Professor for the ensuing year by the Royal College of Surgeons of England.

Capt. Arthur Greene, R.A.M.C.T., has been appointed ophthalmic specialist to the Fifth Army B.E.F.

Enrique B. Demaria has been appointed professor of ophthalmology in Buenos Ayres in succession to Lagleyzea.

* * * *

v. Graefe Prize

THE decision of the judges (Franke, E. Fuchs, Kuhnt, Sattler, and A. Siegrist) as to the best work published during the years 1911, 1912, and 1913, seems to have been a somewhat difficult task. Finally, they decided to divide the v. Graefe prize between J. Ohm for his work on "Miners' nystagmus," and K. Lindner for his on "Inclusion blennorrhœa and trachoma." All the communications in question had been published in the *Archiv für Ophthalmologie.*

* * * *

Archives d'Ophtalmologie

THE July-August, 1917, number of our contemporary, the *Archives d'Ophtalmologie,* is practically devoted to original articles and abstracts dealing with the interesting subject of night-blindness among soldiers. The first-named are by H. Frenkel and Marc Landolt.

* * * *

Archiv für Ophthalmologie

AN EVENT of some literary importance was the publication of a special number of the *Archiv* containing 486 pages of text and a number of plates in September, 1915, in order to celebrate H. Sattler's seventieth birthday. Its articles were contributed by his friends and pupils, among whom may be mentioned the names of Fuchs, Birch-Hirschfeld, Seefelder, E. v. Hippel, Hertel, and C. Hess.

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St. Paul's Eye Hospital, Liverpool

IN memory of the late A. Nimmo Walker, surgeon to the institution, who was killed in action in September, 1916, a bed has been endowed at St. Paul's Eye Hospital, and an indebtedness of upwards of two thousand pounds has been cleared off.

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The Sight of Railwaymen

MANY branches of the National Union of Railwaymen are agitating for a revision of the test of sight. The North-Eastern men are urging a special conference to consider the matter. The Midland men favour an amendment of the Workmen's Compensation Act to bring failure of sight under industrial diseases. The Manchester men want the Board of Trade to sanction railwaymen wearing glasses while on duty.